

1/65

FIGURE 1A

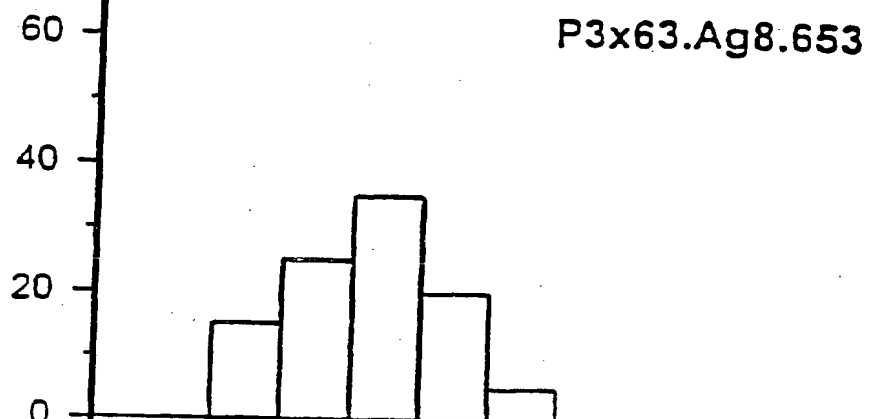


FIGURE 1B

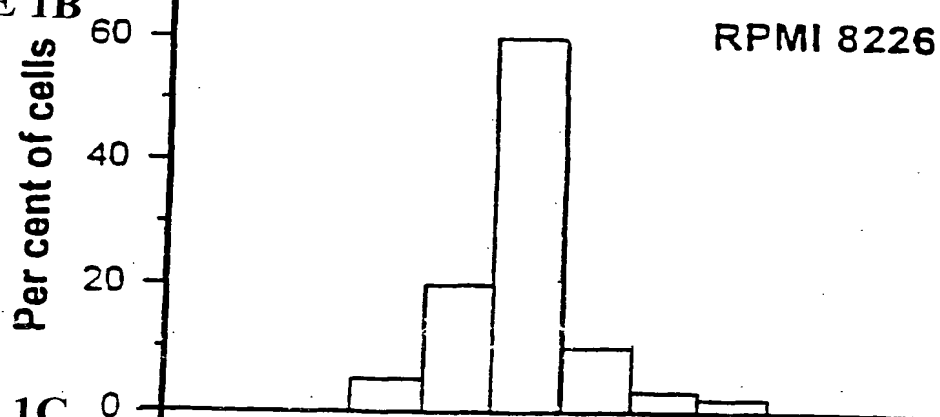
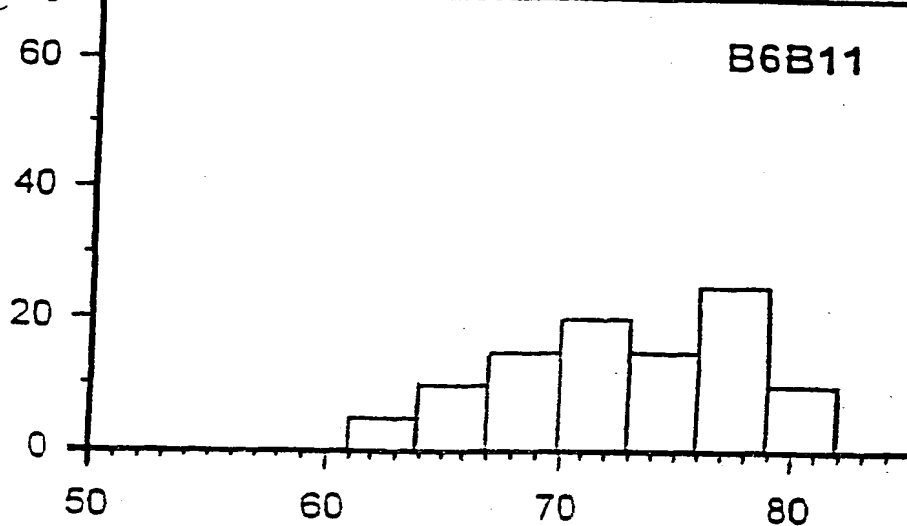


FIGURE 1C



Number of chromosomes

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FIGURE 2



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FIGURE 3

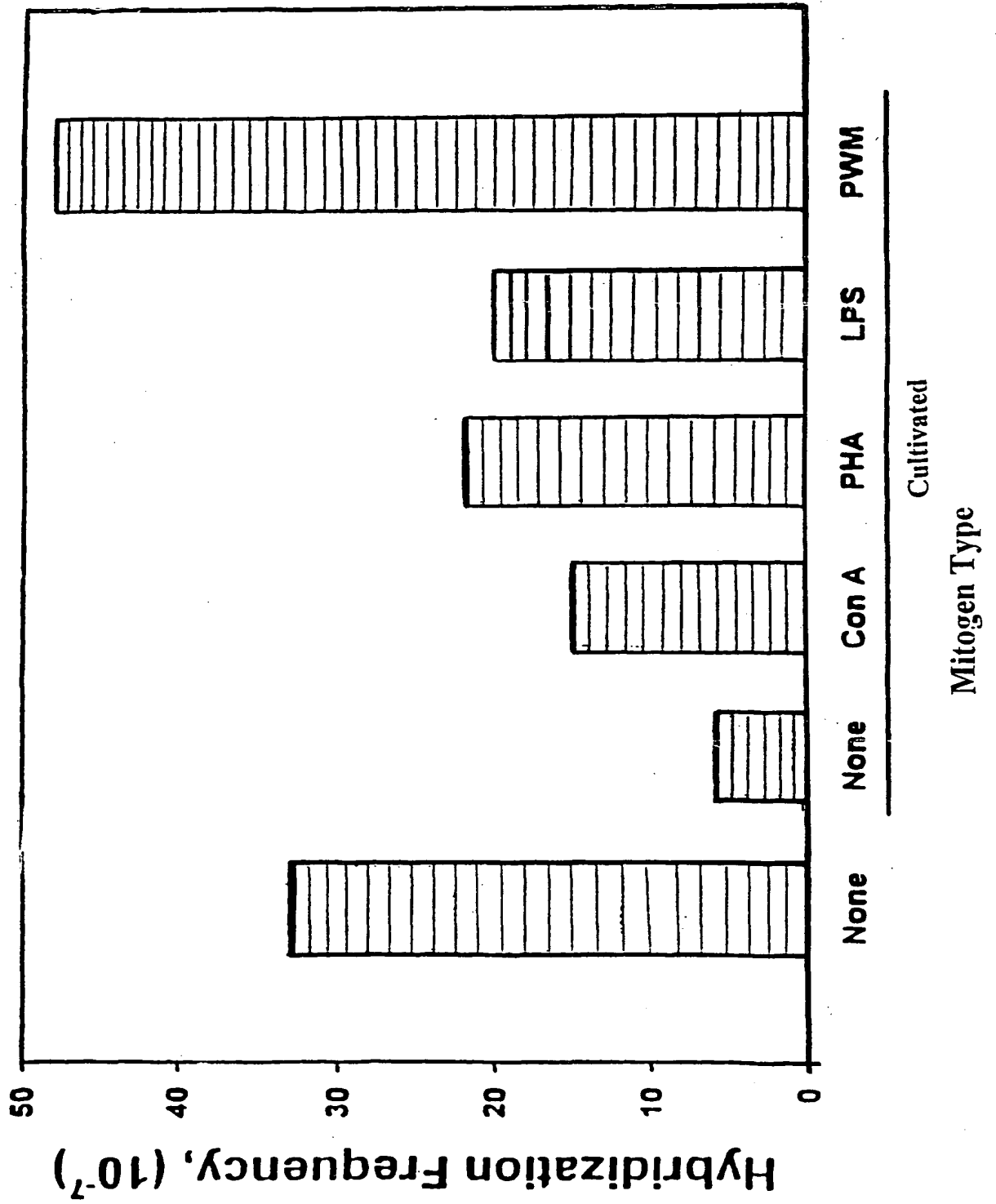


FIGURE 4A

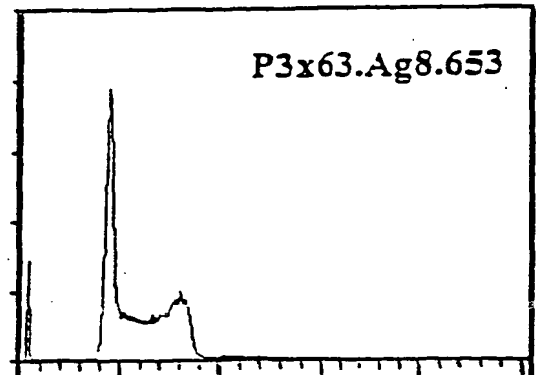


FIGURE 4B

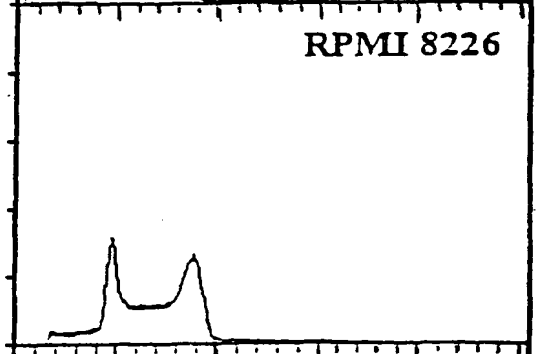


FIGURE 4C

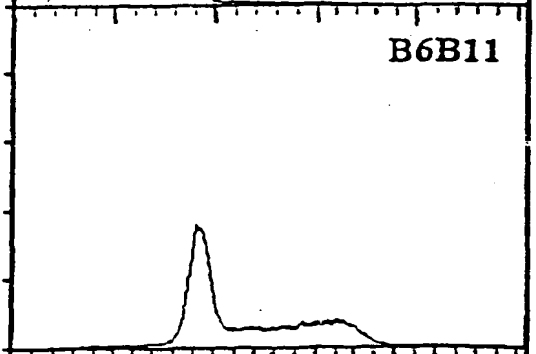


FIGURE 4D

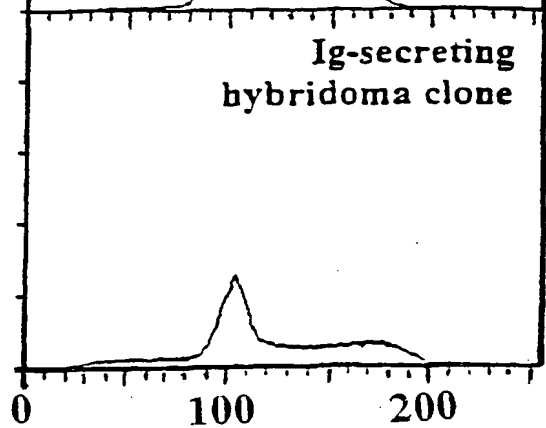


FIGURE 5A

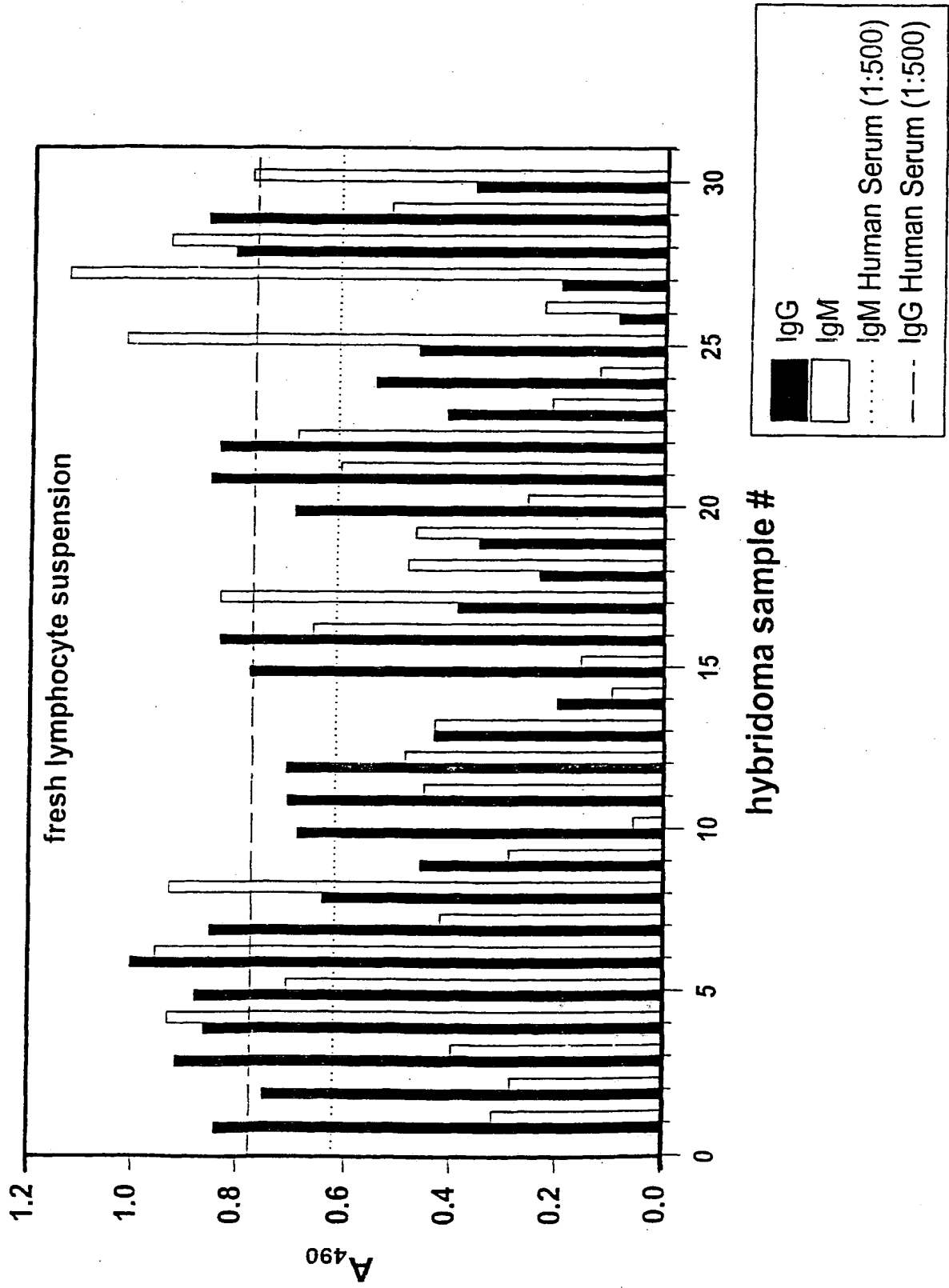
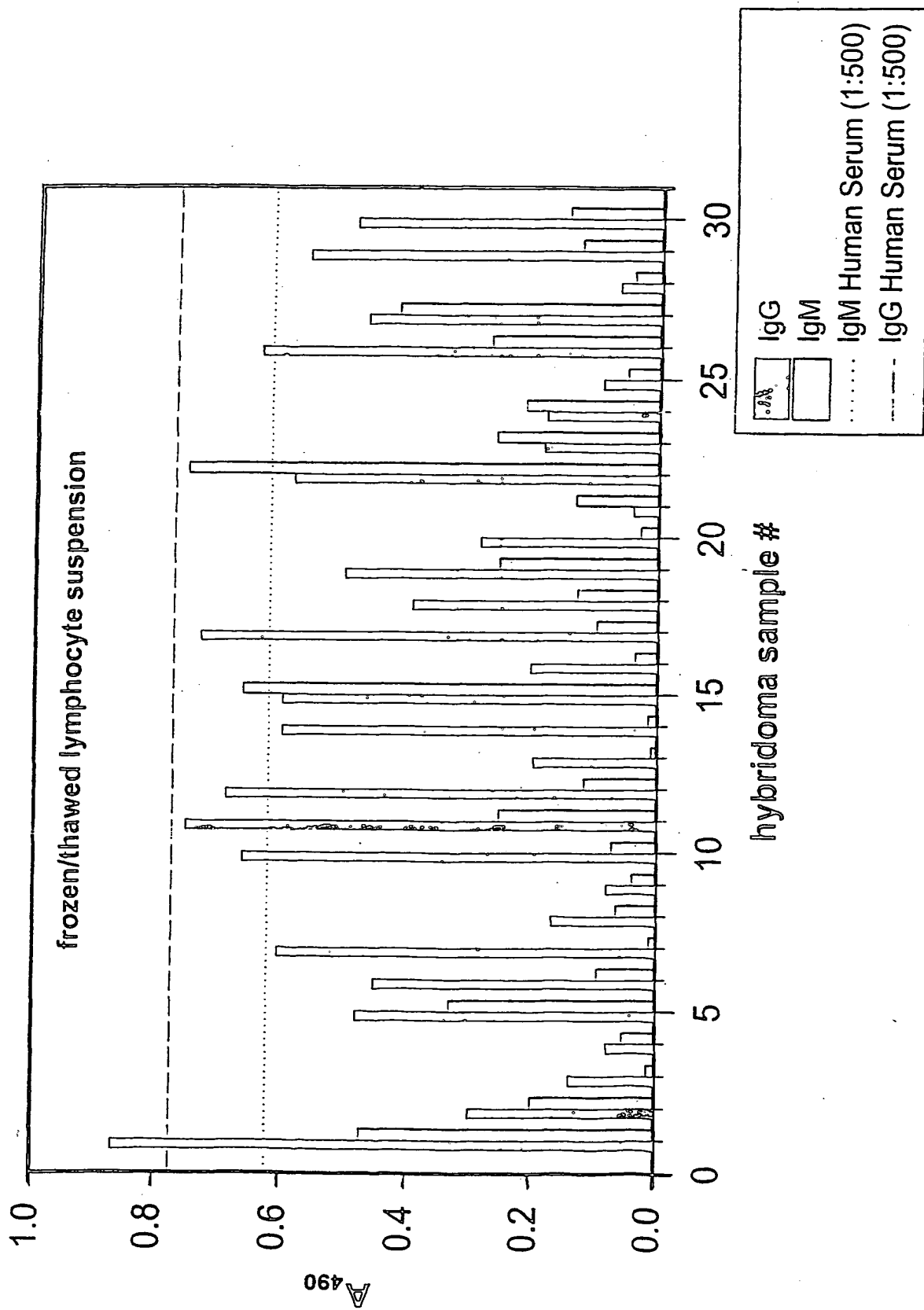
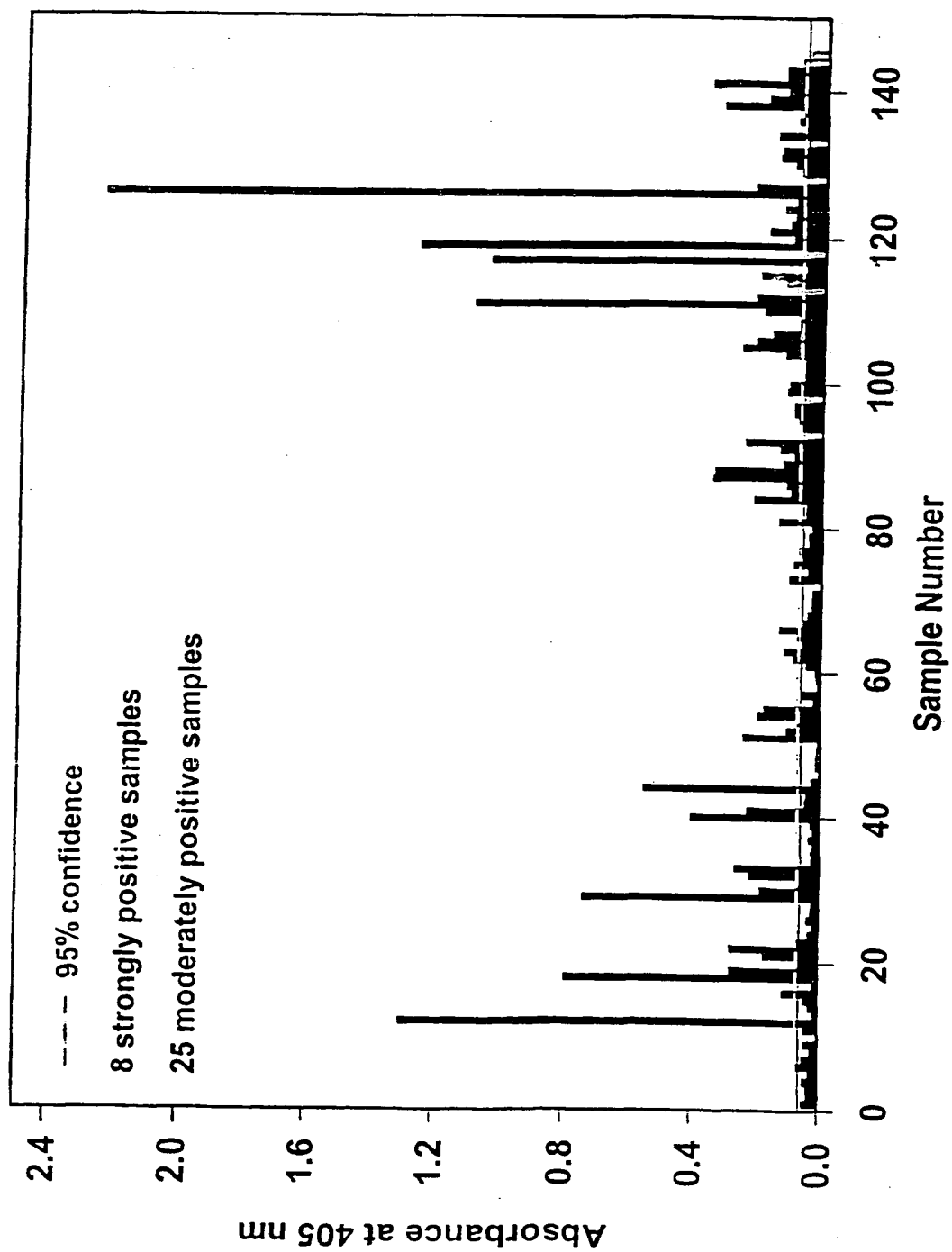


FIGURE 5B



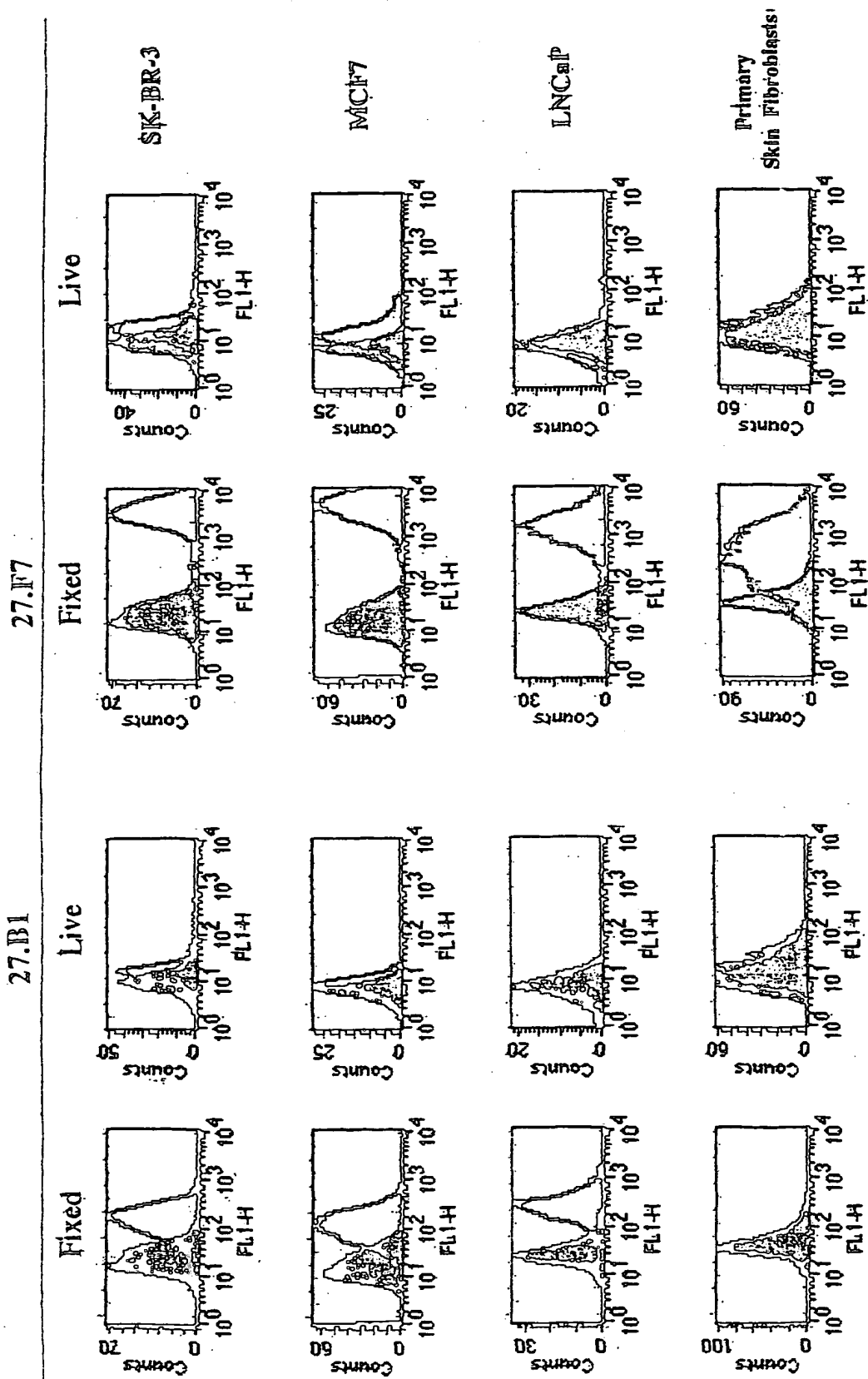
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FIGURE 6



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FIGURE 7



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FIGURE 8 Expression of 27.F7 and 27.B1 Antigen
on Different Human Cell Lines

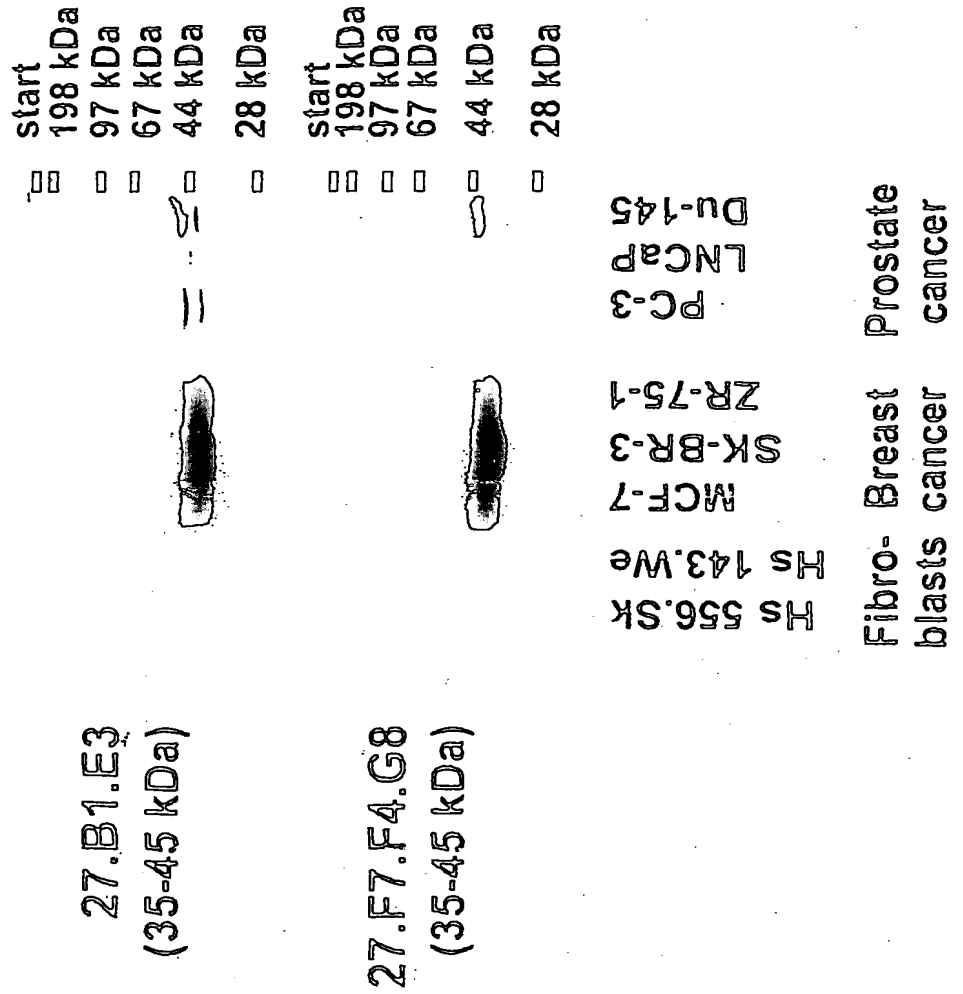


FIGURE 9

Detection of TIP2
in MCF-7 Cells
using Antibodies



27.F7 and
anti-human k-FITC



27.B1 and
anti-human k-FITC



polyclonal mouse
anti-TIP2 and
anti-mouse Ig-TRITC

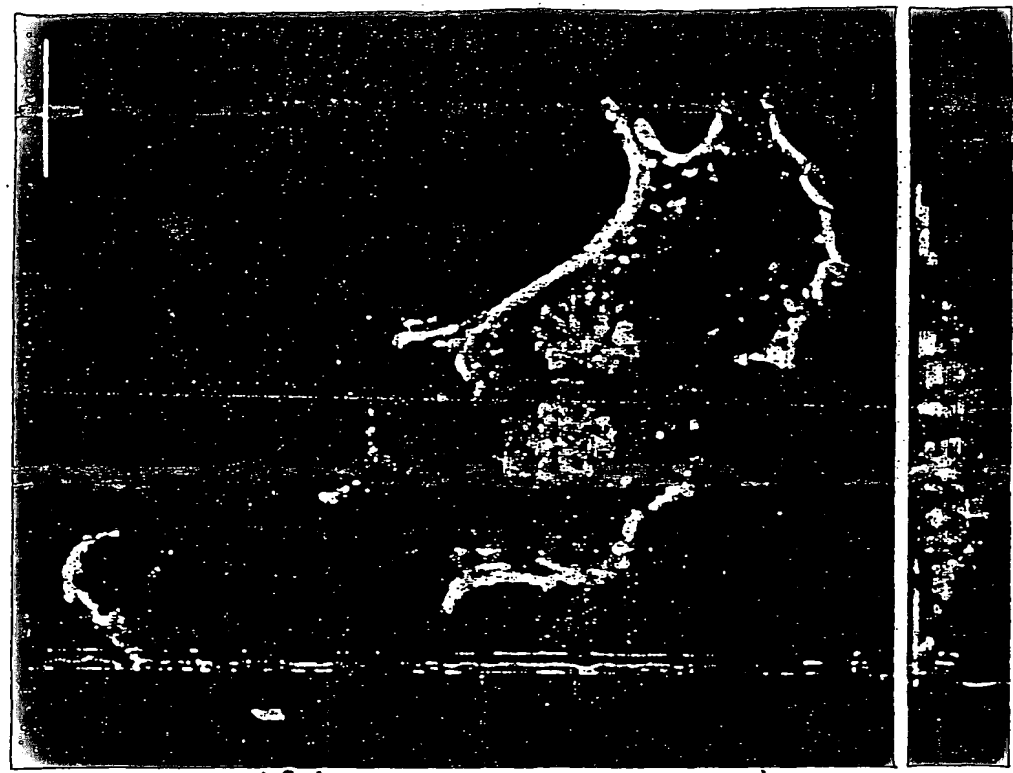


SK-BR-3



LNCaP

Cellular Distribution of the Antigen
(Confocal Microscopy)



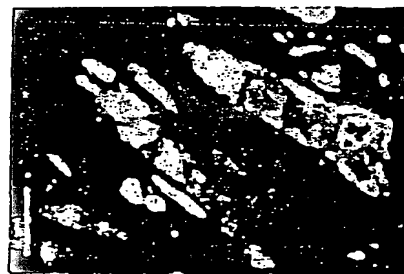
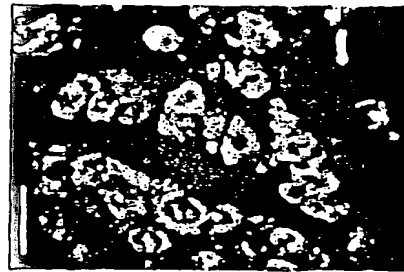
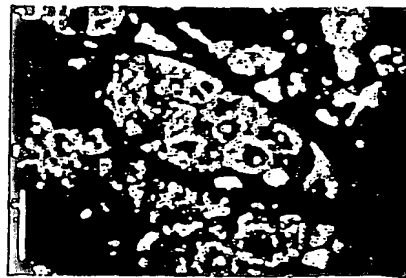
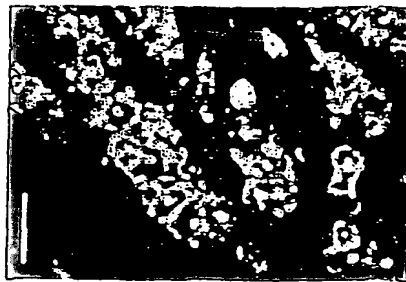
Size bars represent 20um

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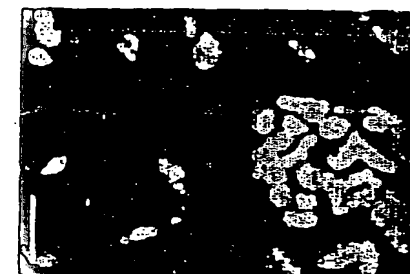
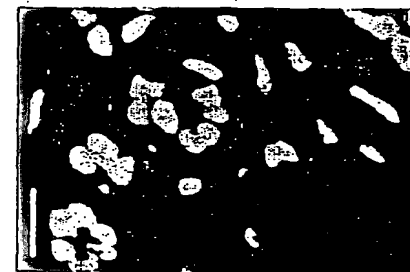
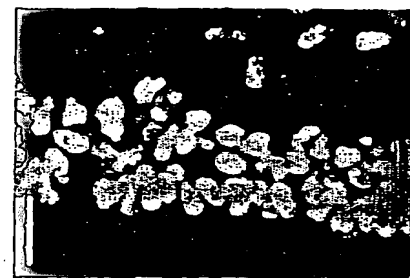
FIGURE 10

Indirect Immunostaining with 27.F7

Invasive Ductal Carcinoma



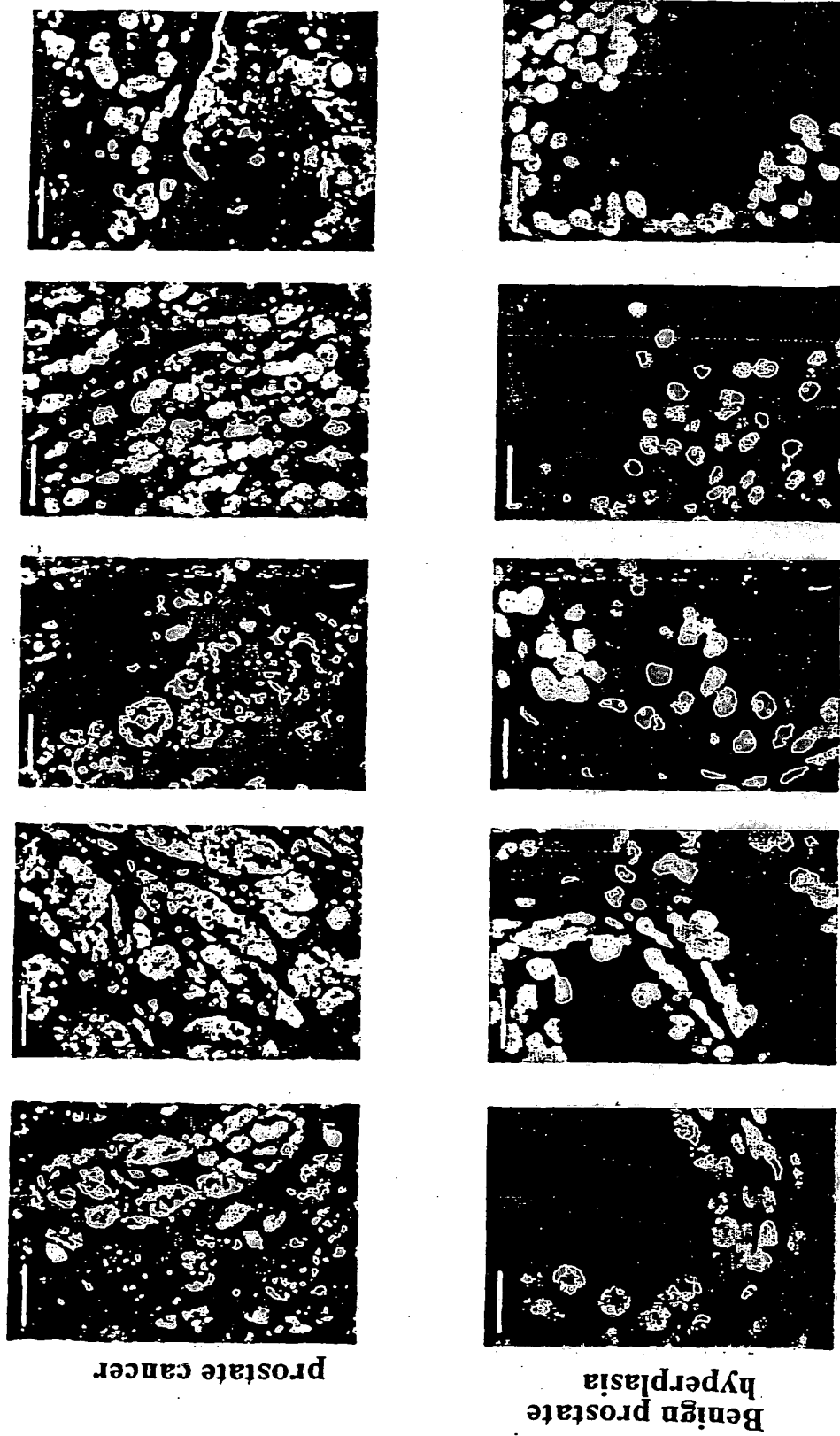
Normal Breast



Size bars represent 20µm

FIGURE 11

Indirect Immunostaining with 27.B1



Size bars represent 20µm

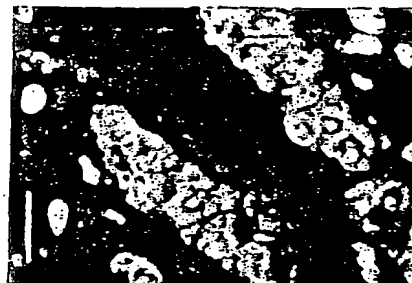
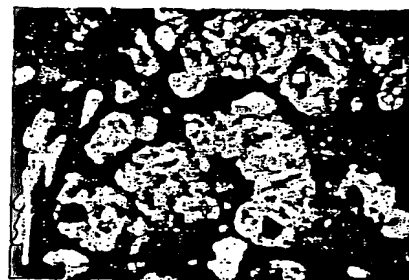
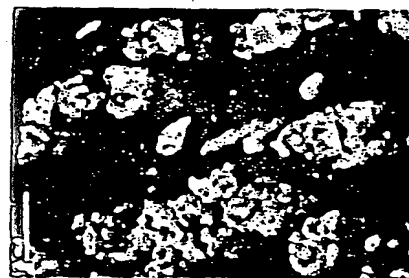
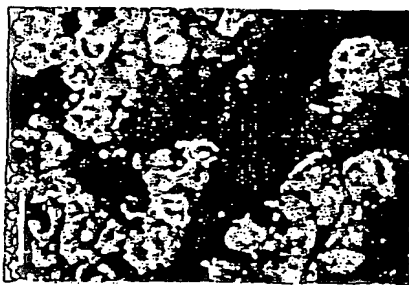
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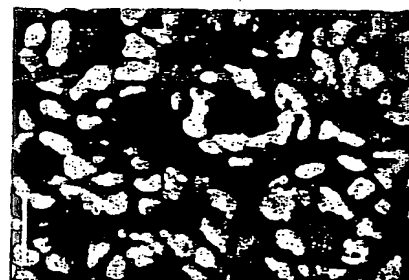
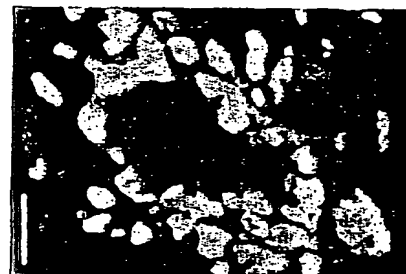
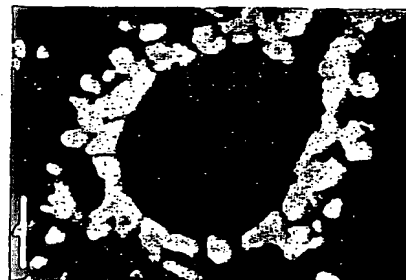
FIGURE 12

Indirect Immunostaining with 27.B1

Invasive Ductal Cancer



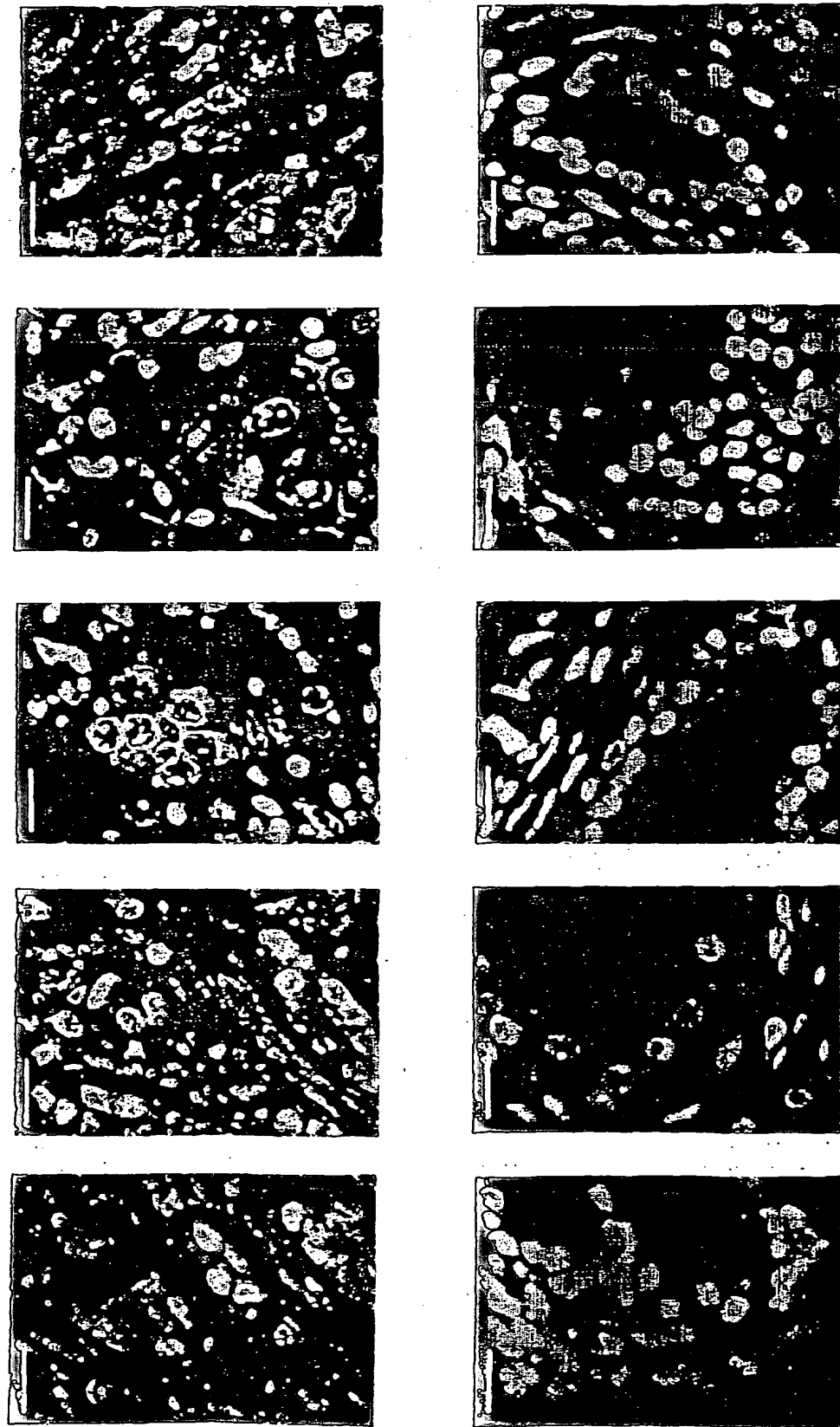
Normal Breast Tissue



Size bars represent 20µm

FIGURE 13

Indirect Immunostaining with 27.F7



prostate cancer

benign prostate hyperplasia

Size bars represent 20µm

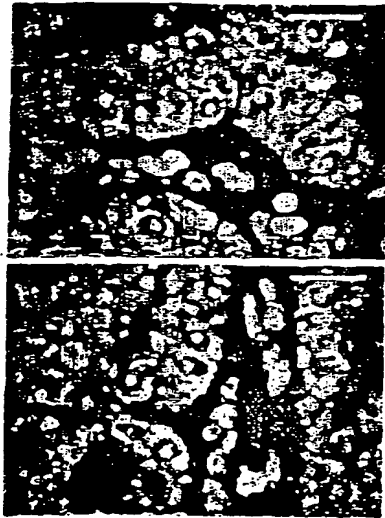
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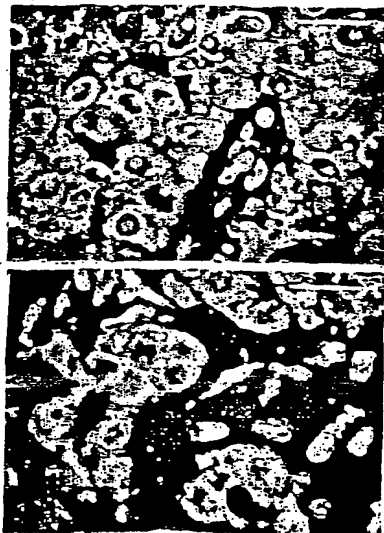
FIGURE 14

Immunostaining of Breast Cancer Metastases in Regional Lymph Nodes

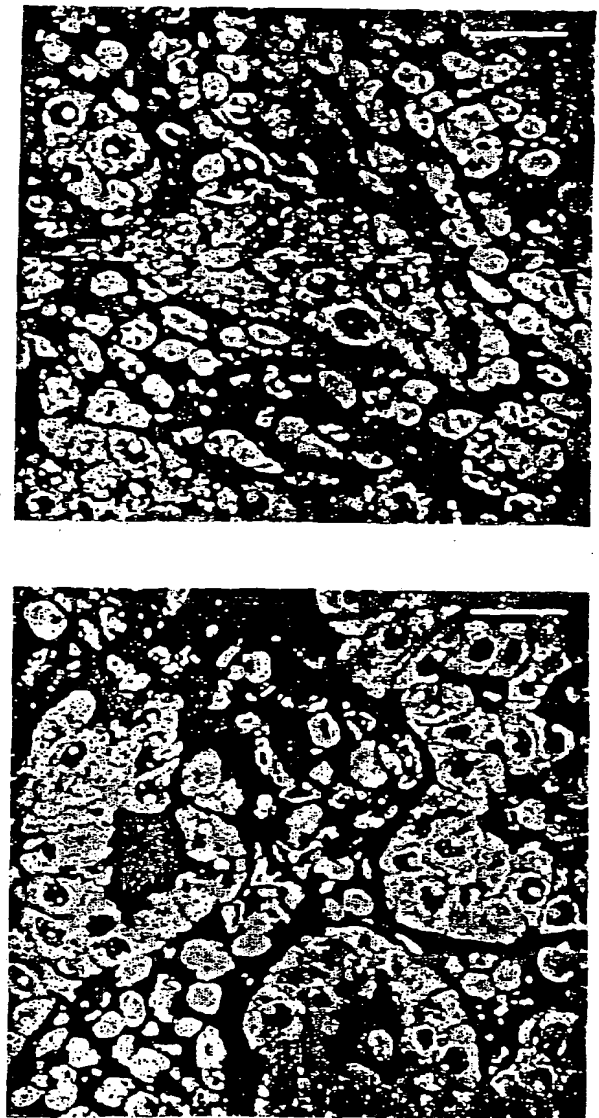
Antibody: 27.B1



Antibody: 27.F7



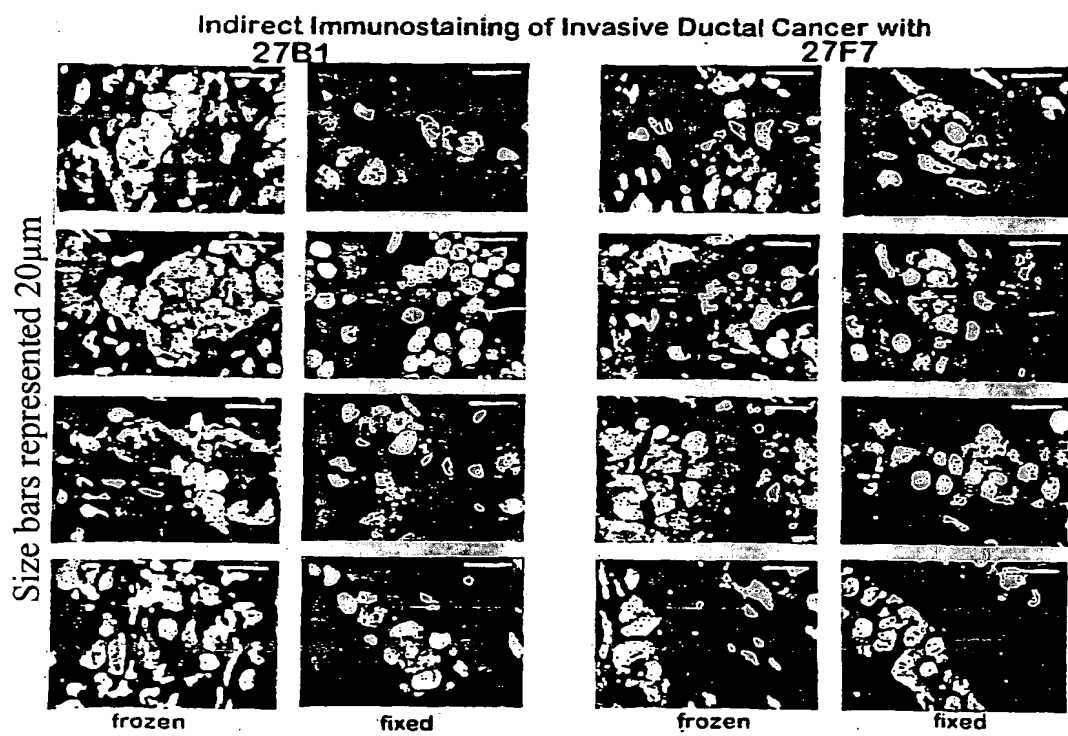
Distribution of the Antigen (Confocal Microscopy)



Size bars represent 20μm

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FIGURE 15



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FIGURE 16

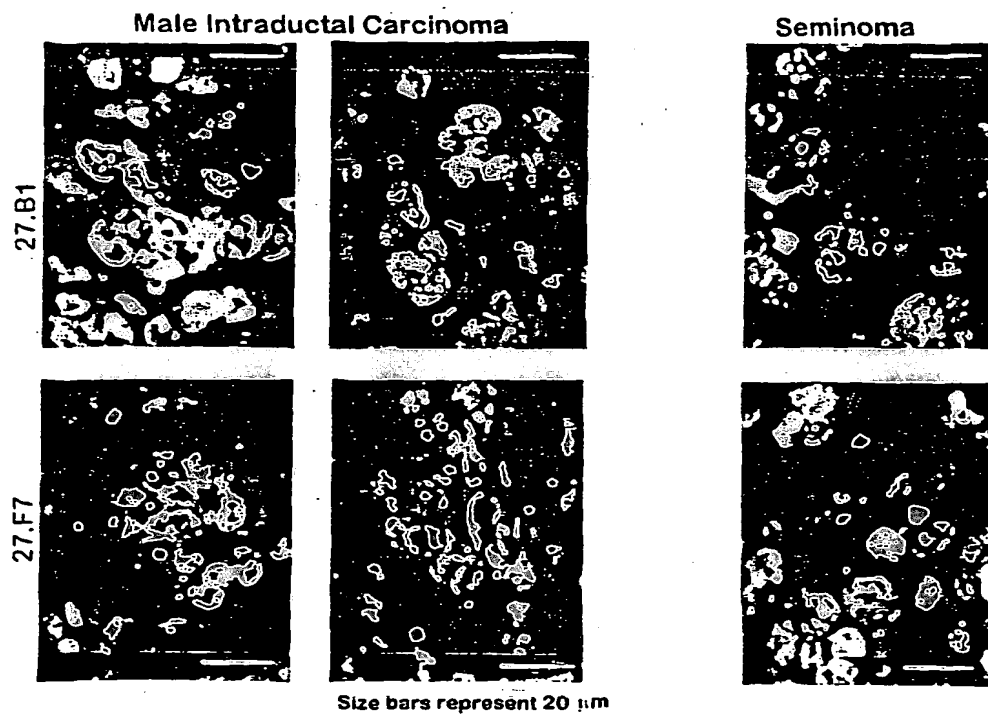
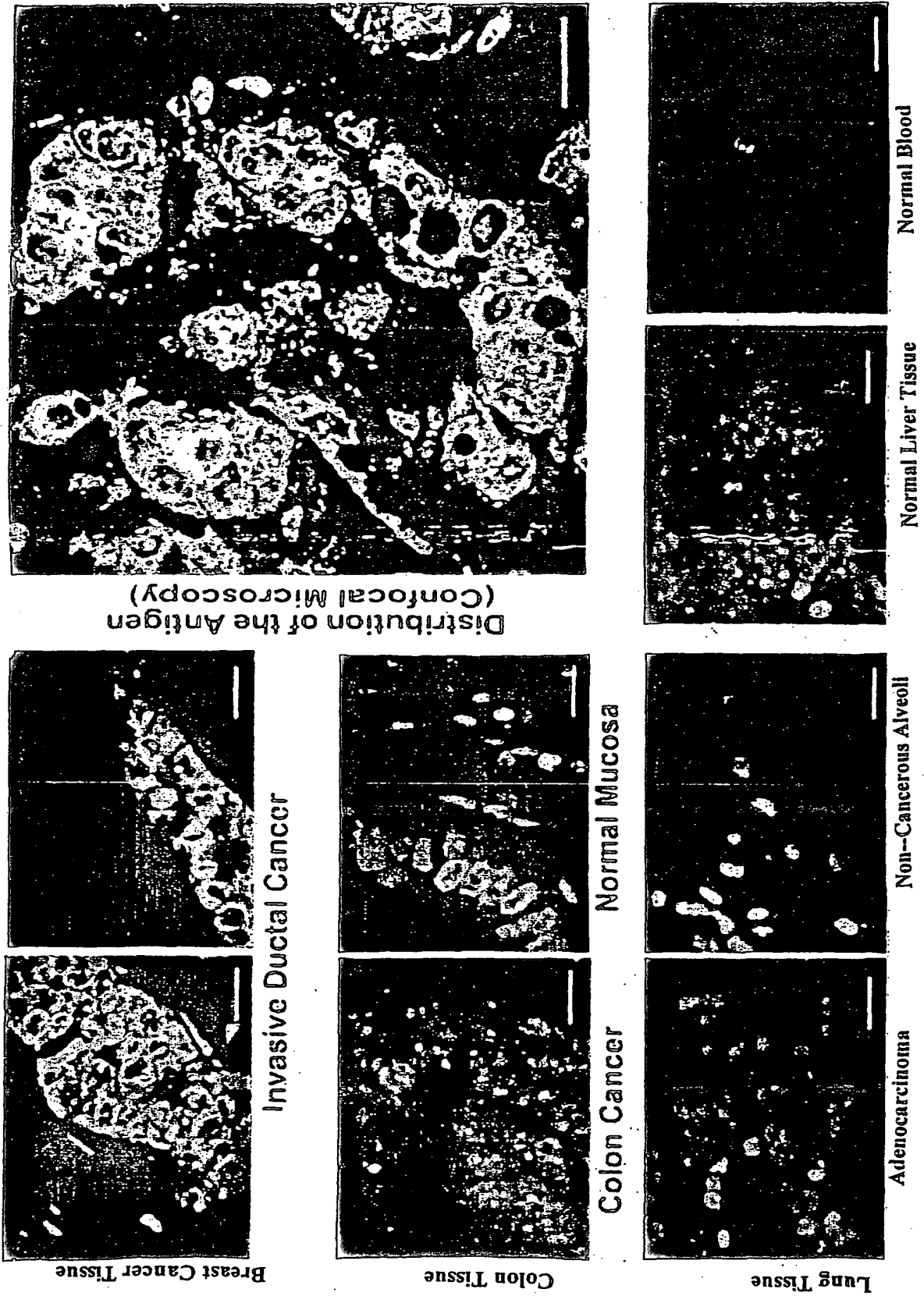


FIGURE 17

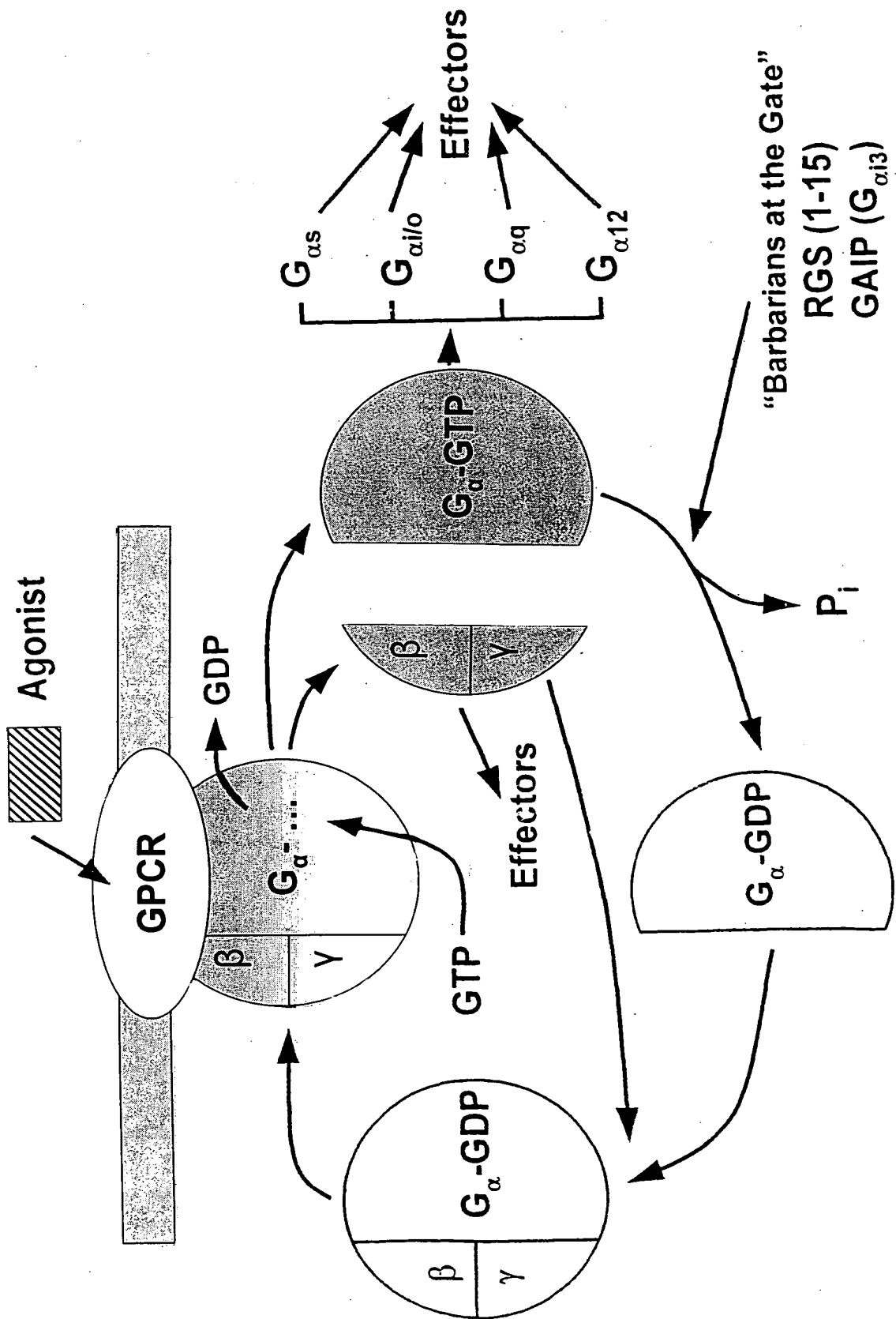
Indirect Immunostaining with 27.B1



Size bars represented 20µm

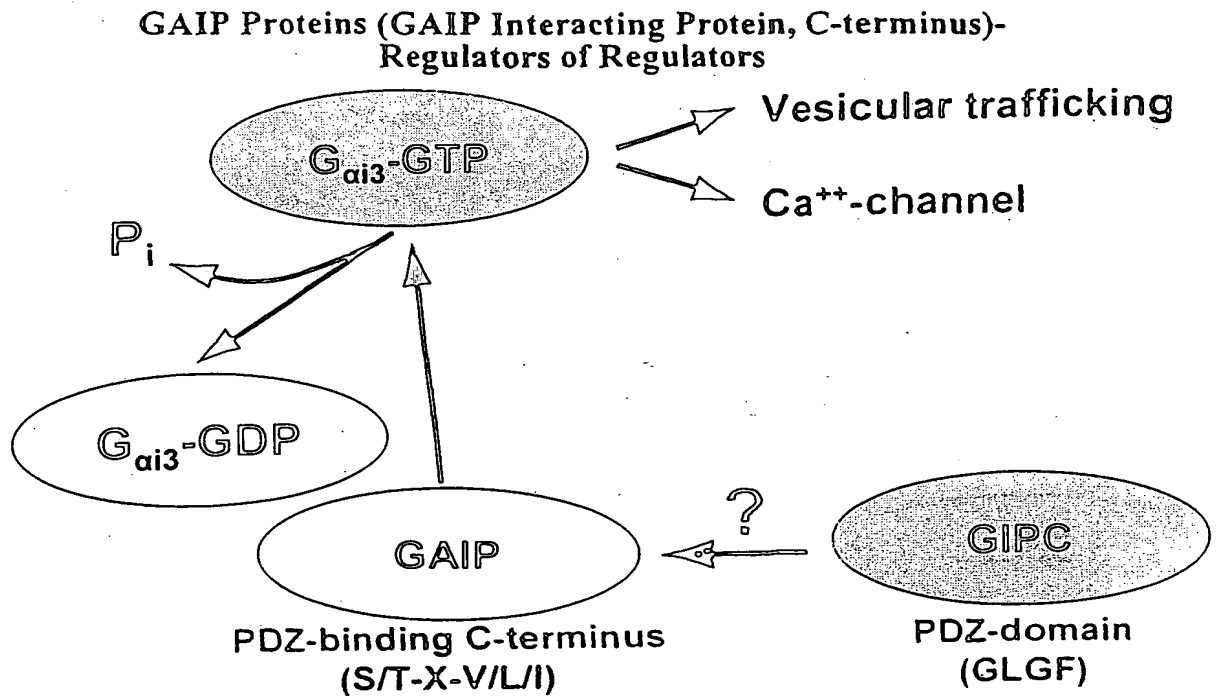
FIGURE 18

Regulation of G-protein Signaling



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FIGURE 19

**GIPC Family Proteins**

- TAX interacting protein 2 (TIP-2)
- Neurophilin binding protein (NIP)
- M-Semaphorin F cytoplasmic domain associated protein (SEMCAP-1)

Other PDZ-"binders"

- NMDA
- TAX oncoprotein
- HPV E6
- AdD9 E4
- glycophorin C
- FAS
- APC
- LET-23
- CXCR2 (IL-8 RB)
- CXCR5 (coreceptor HTLV-1/HIV)

Other PDZ-"containers"

- PSD-95
- DlgA/DLG
- ZO-1
- p55
- LIN7
- PTPL1/FAP1
- RGS12
- PDZ-73 (NYCO38)

FIGURE 20

PRINCIPLE OF SEROLOGICAL RECOMBINANT EXPRESSION CLONING (SEREX)
TECHNOLOGY FOR IDENTIFICATION OF TUMOR ASSOCIATED ANTIGENS

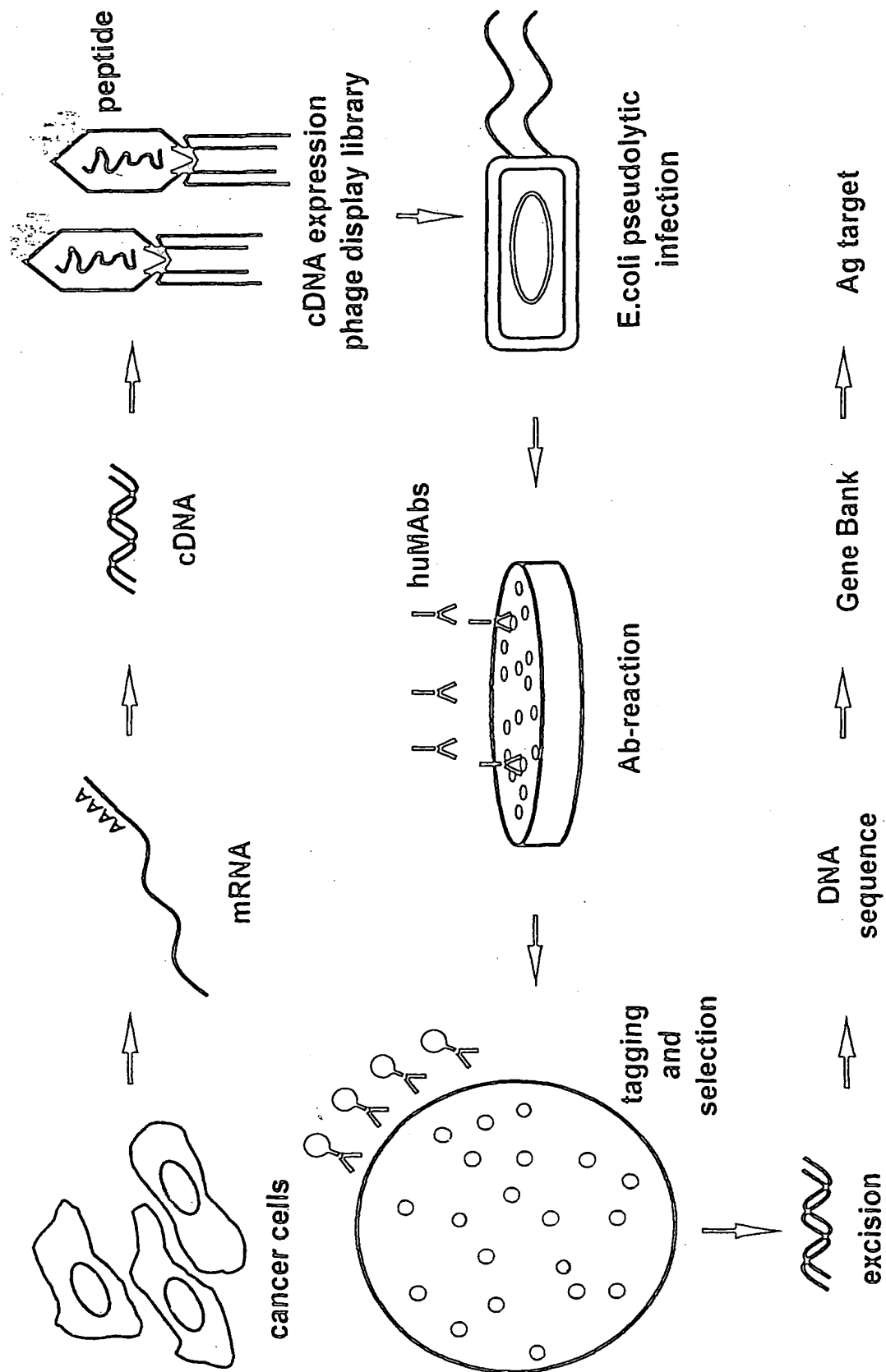


FIGURE 21

DEVELOPMENT OF MOUSE anti-TIP-2 ANTIBODIES USING HUMAN anti-TIP-2 ANTIBODY BOTH AS A CAPTURE AND A TAG

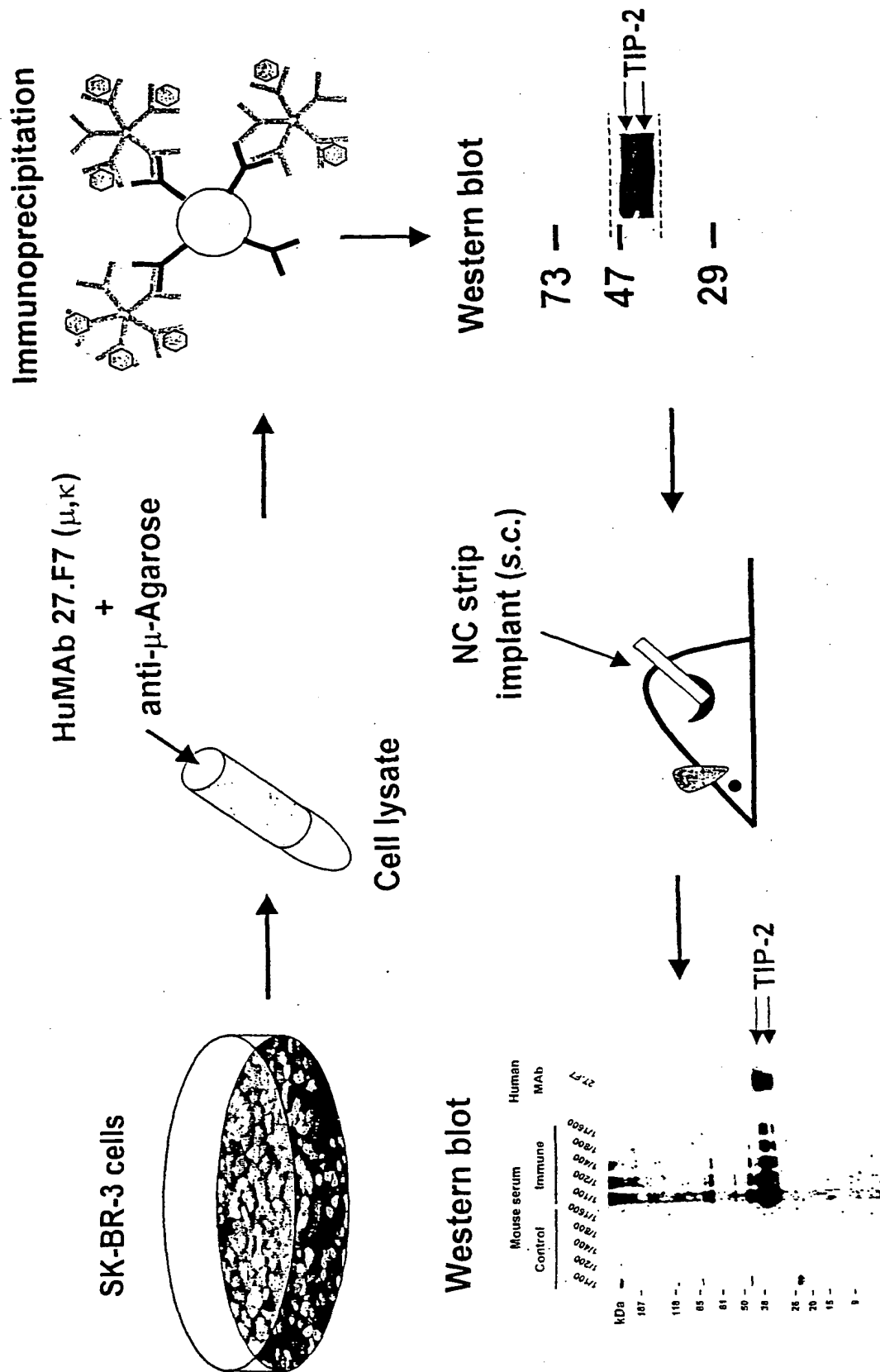


FIGURE 22

SERUM IMMUNOREACTIVITY IN MOUSE IMMUNIZED WITH BREAST CANCER-ASSOCIATED ANTIGEN TIP-2

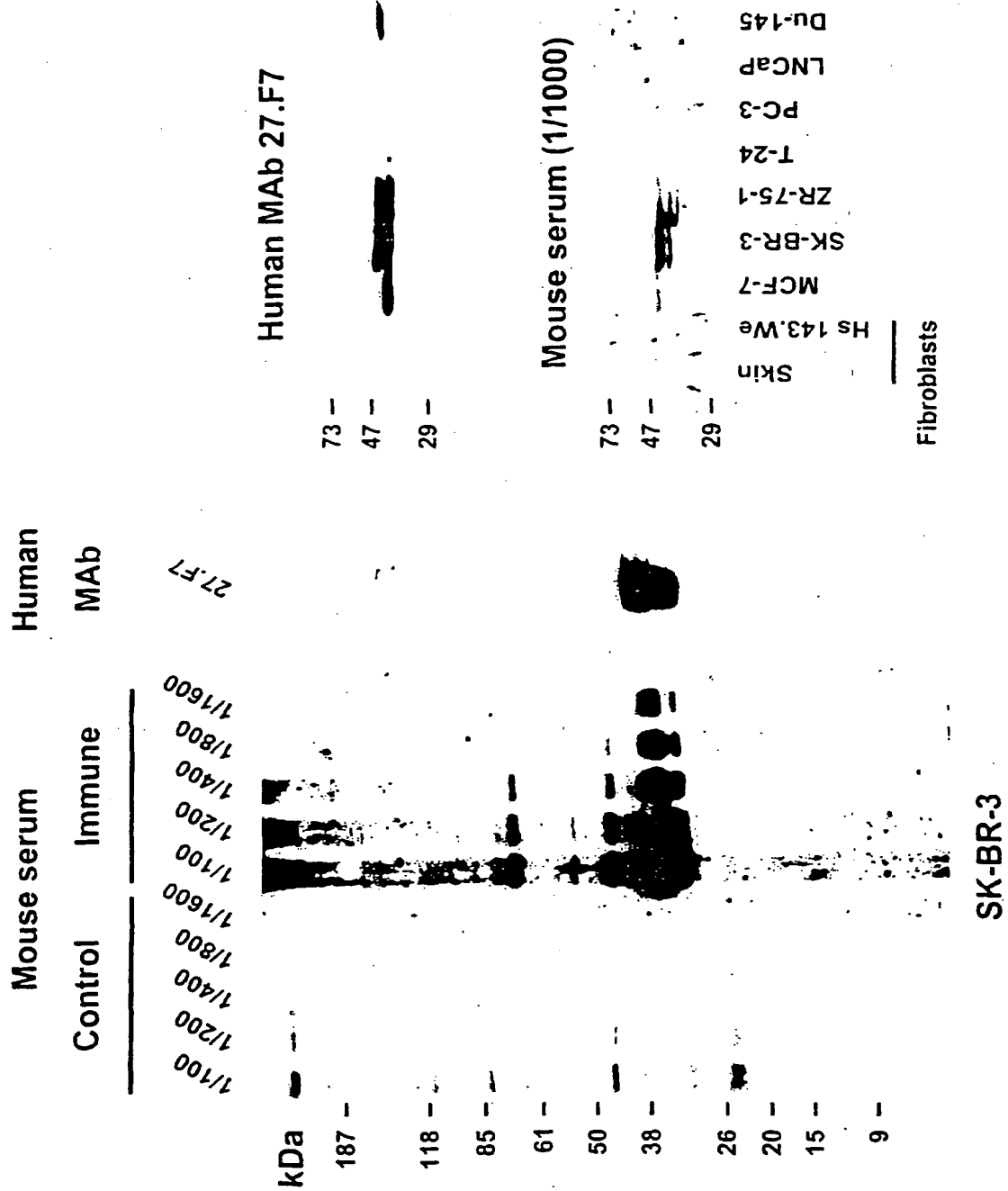


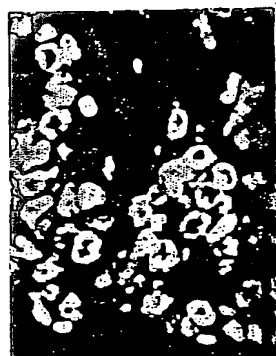
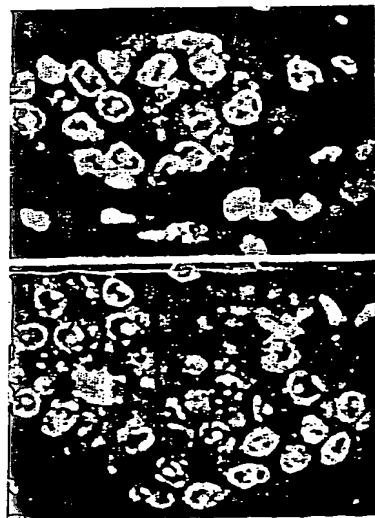
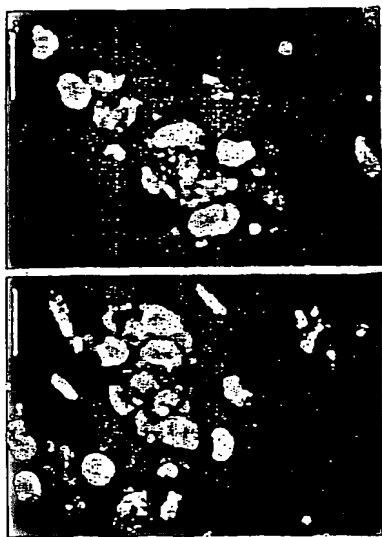
FIGURE 23

Invasive Ductal Cancer Tissue Stained Indirectly with:

27.F7

Polyclonal mouse anti-TIP2

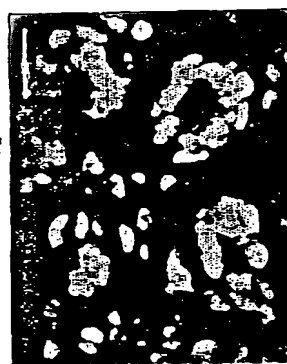
Controls



Second Antibody Control



Control Mouse Serum and
Second Antibody Control

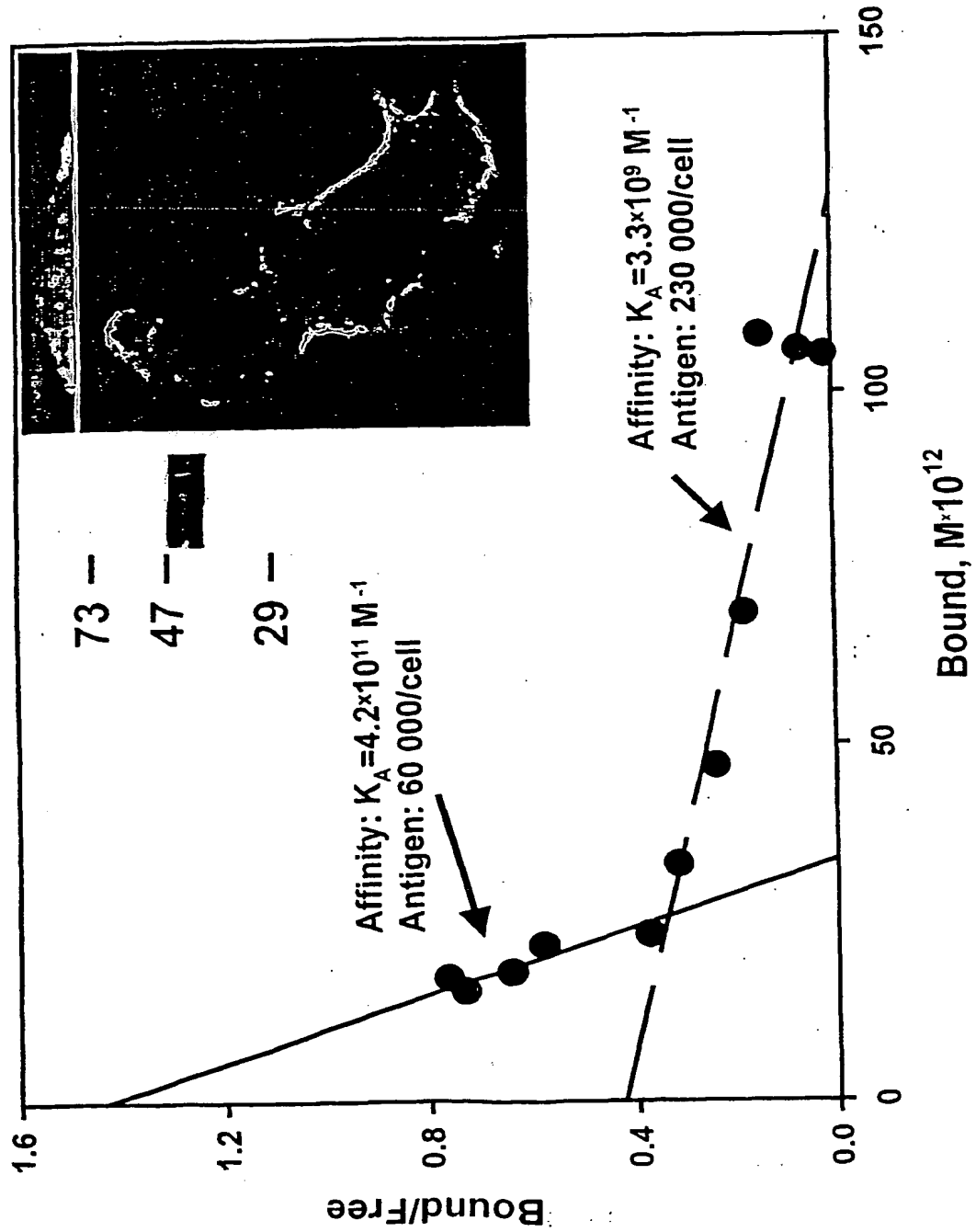


Normal Breast Tissue
Indirectly stained with
mouse anti-TIP2

Distribution of the Antigen
(Confocal Microscopy)

Size bars represent 20 μ m

FIGURE 24

Analysis for Human anti-TIP-2 Antibody 27.F7 (μ , K) on SK-BR-3 Cells

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FIGURE 25

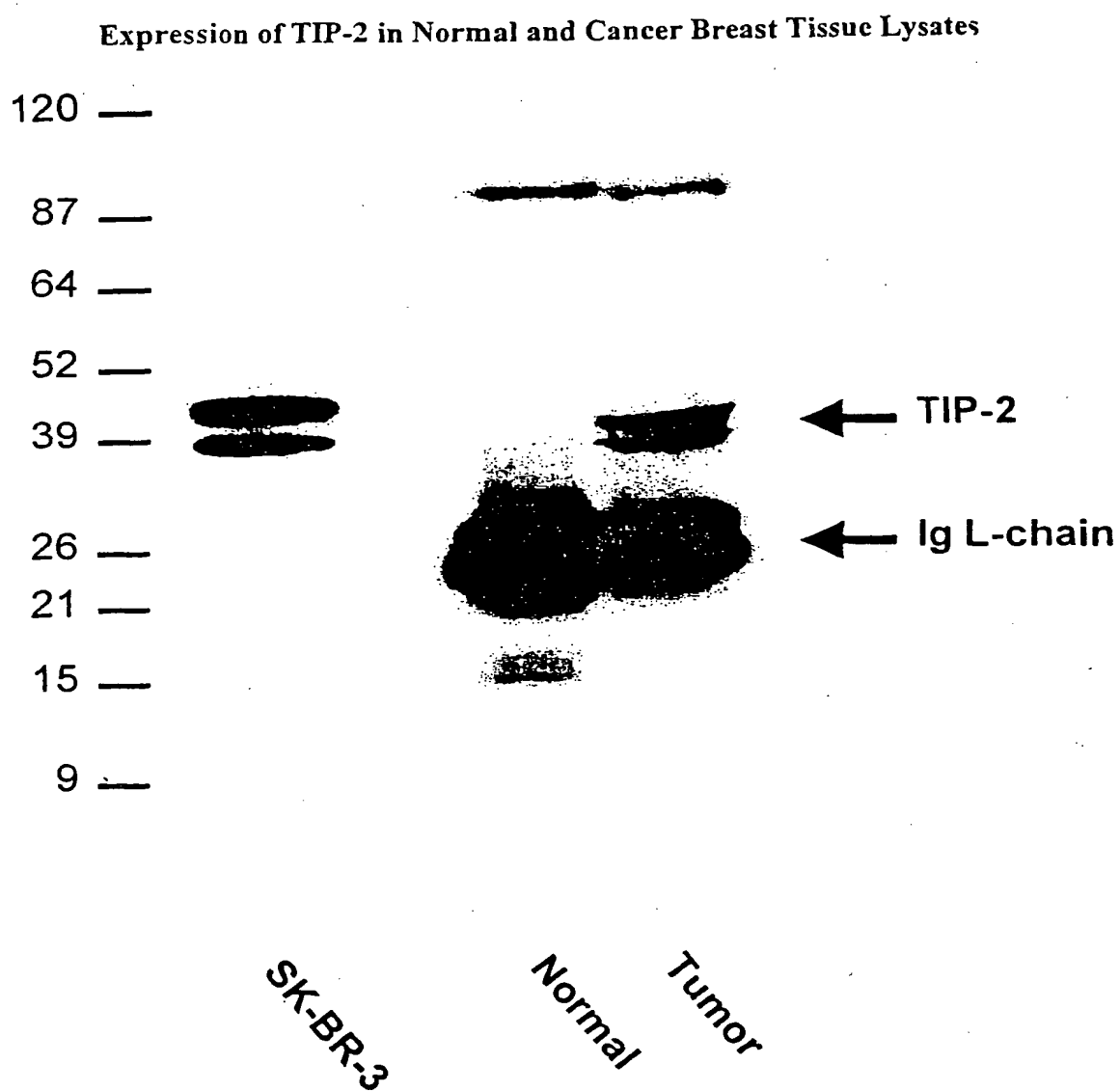
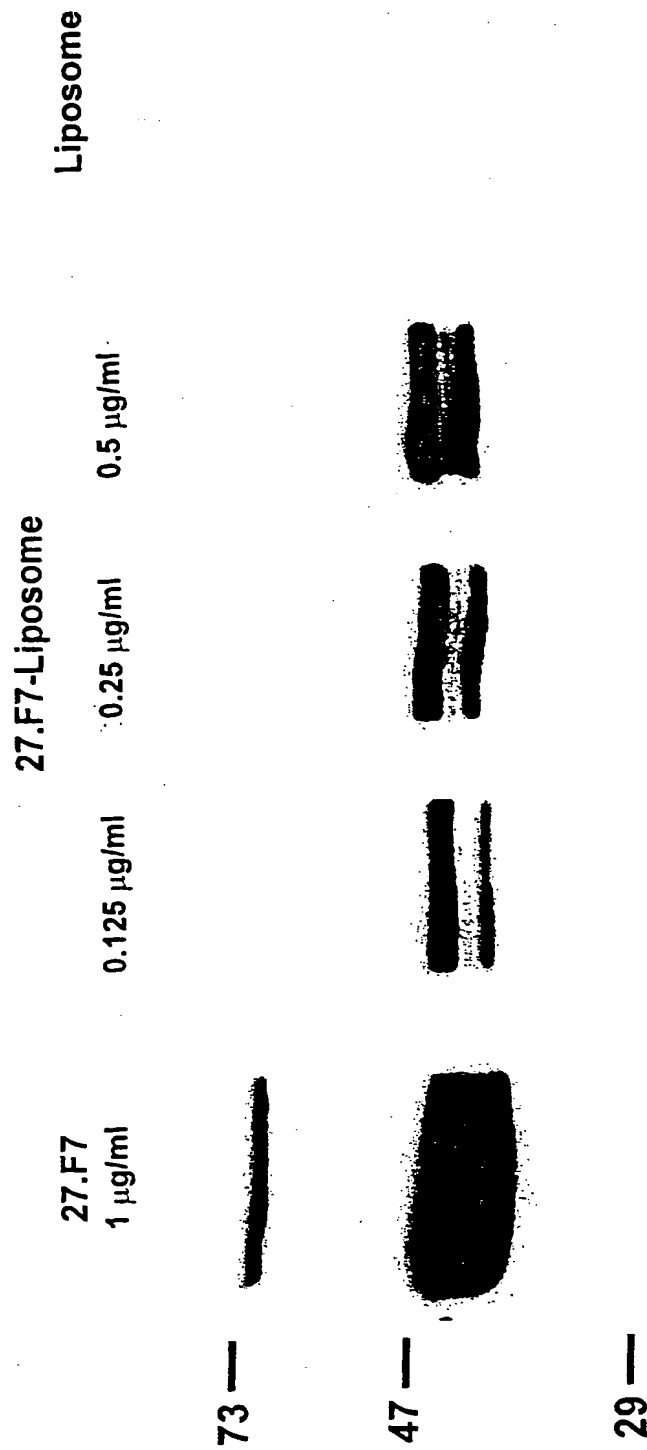


FIGURE 26

Coupling of anti-TIP-2 Antibody 27.F7 (μ , K) to Liposomes



Western blot of SK-BR-3 cell lysate

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FIGURE 27

Alcohol Fractionation of Human Serum Spiked with SK-BR-3
Lysates (TIP-2 Containing)

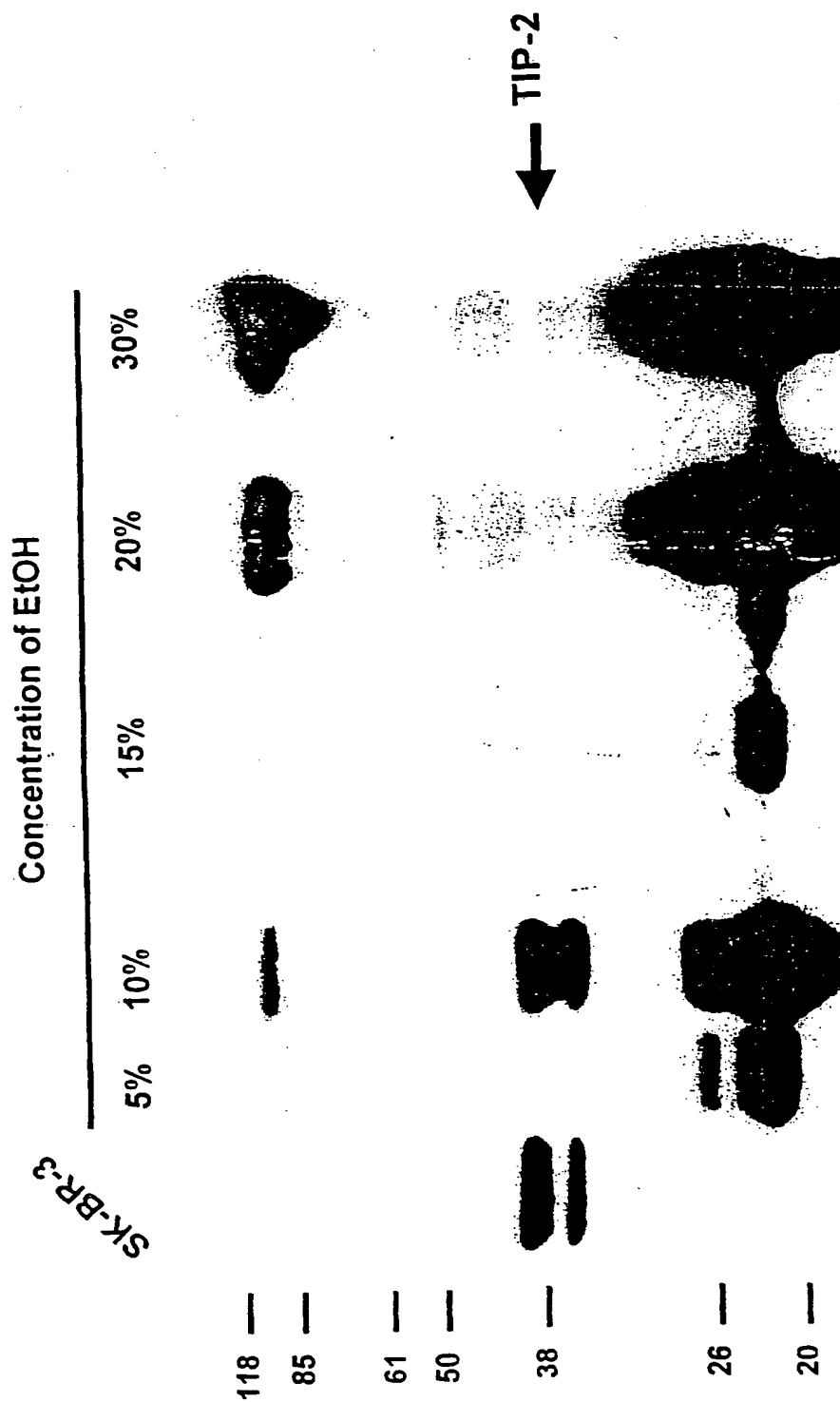


FIGURE 28

Release of TIP-2 into Culture Media from SK-BR-3 Cells Treated by Taxol

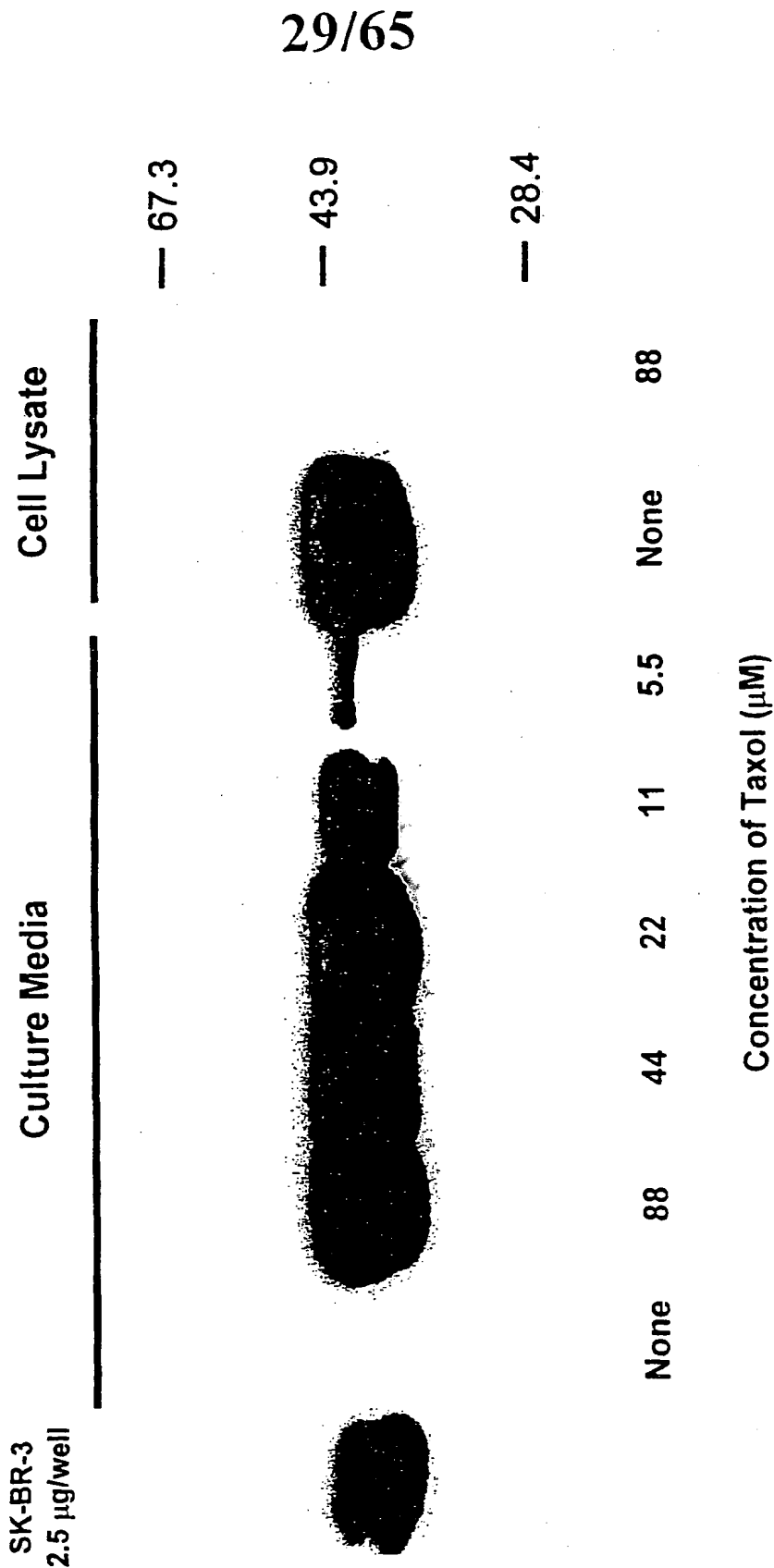


FIGURE 29 Amino Acid Sequence of GLUT1CBP/GIPC Protein

10	20	30	40	50	60
MPLGLGRRKK	APPLVENEAA	EPGRGGLGVG	EPGRPLGGGS	GSPQMGGLPPP	PPALRPRLVF
70	80	90	100	110	120
HTQLAHGSPT	GRIEGFTNVK	ELYGKIAEAF	RLPTAEVMEC	TLNTHKVDMD	<u>KLLGGQIGLE</u>
130	140	150	160	170	180
DFIFAHVKGQ	RKEVEVEFKSE	DAIGLTITDN	GAGYAFIKRI	KEGSVIDHIH	LISVGDMIEA
190	200	210	220	230	240
<u>INGQSLLGCR</u>	<u>HYEVARLLKE</u>	LPRGRFTTLK	LTEPRKAFDM	ISQRSAGGRP	GSGPQLGTGR
250	260	270	280	290	300
GTLRLRSRGP	ATVEDLPSAF	EEKAKIEKVDD	LLESYMGIRD	TELAATMVEL	GKDKRNPDEL
310	320	330			
AEALDERLGD	FAFPDEFVFD	VMGAIGDAKV	GRY		

TIP-2 sequence is shown in *italic*
 HLA A*0201 binding peptides (111-119 and 185-194) are shown underlined

FIGURE 30

1 caggggagg cggaggcagc gggggcggcg gggcgggcg cggcgggcg gggcagatc
 61 ttctgggtgac ccactttctc gctgctcatg ccgctgggac tggggcgccg gaaaaaggcg
 121 cccctcttag tggaaaaatga ggggctgag ccaggccgtg gagggctggg cgtgggggag
 181 ccaggggcctt tgggcggagg tgggtcgggg gggcccccataa tgggcttgcc ccccccctccc
 241 ccagcccctgc gggcccgcct tgtgtccac acccagctgg cccatggcag tcccactggc
 301 cgcatcgagg ggttcaccca cgtcaaggag ctgtatggca agatggccga ggccttccgc
 361 ctggccaaactg ccgagggtgat gttttgcacc ctgaaacacc acaaaagtggaa catggaaaca
 421 ctccctggggg gccaaaatcgg gctggaggag ttcaatcttcg cccacgtgaa ggggacaggcc
 481 aaggagggtgg aggtgttcaa gtccggaggat gcactcgggc tcaaccaacac ggaacaaaggg
 541 gctgggtacg ccttcataaa gcgcatacaag gaggggcagg tgatcgacaa catccaccctc
 601 atcaggctgg gcgacatgat cgaaggccatt aacgggcaga gccctgctggg ctgcccggcac
 661 tacgaaagtgg cccggctgct caaggaaactg cccggaggcc gtaccctcac gctgaaagctc

FIGURE 31A
Protein Antigens Identified by Natural Human Monoclonal Antibodies Developed from Breast and Prostate Cancer Patients' B-Cells

Antibody	Antigen Name	Sequence	Molecular Weight (Calculated)	HLA A*0201-Specific MHC Binding Peptides	mRNA Expression in Tissues	Functions
13.42 μκ	Human mRNA for KIAA0338 gene, partial cds	See Fig. 32	103568 (~40kD by WB)	NLLEKDYFGL (184-193) VLFDLVCEHL (174-183) KLQHPDMLV (903-911)	Brain	Unknown
13.2C1 μκ	Human non-muscle alpha-actinin mRNA, complete cds - the second non muscle alpha-actinin isoform designated ACTN4 (actinin-4)	See Fig. 33	105217	KMLDAEDIV (238-246) KMTLGMIVTI (139-148) FMPSEGMV (374-382) KLASDLLEWI (302-311) GLVTFAQFI (825-833) CQLEINFNSV (333-362)	Adipose, Adrenal gland, Aorta, Brain, Breast, CNS, Colon, Ear, Esophagus, Foreskin, Germ Cell, Heart, Kidney, Liver, Lung, Muscle, Ovary, Pancreas, Parathyroid, Placenta, Prostate, Small intestine, Stomach, Testis, Thyroid, Tonsil, Uterus, Whole embryo, breast, colon, genitourinary tract, head neck, lung, cell line, ovary, stomach "...100kD alpha-actinin was found in the extracellular matrix of bone marrow stroma by Western blot and immunofluorescence microscopy" [Exp. Hematol. 1999, 27(2):345-52].	Actin-binding protein important in organization of cytoskeleton and in cell adhesion. "An amino-terminal fragment of alpha-actinin can promote monocyte/macrophage maturation" [Exp. Hematol. 1999, 27(2):345-52].
13.2C1 μκ	Homo sapiens actinin, alpha 4 (ACTN4) mRNA	See Fig. 34	102260	KMLDAEDIV (212-220) KMTLGMIVTI (113-122) FMPSEGMV (345-353) KLASDLLEWI (273-282) GLVTFAQFI (797-805)	Adipose, Adrenal gland, Aorta, Brain, Breast, CNS, Colon, Ear, Esophagus, Foreskin, Germ Cell, Heart, Kidney, Liver, Lung, Muscle, Ovary, Pancreas, Parathyroid, Placenta, Prostate, Small intestine, Stomach, Testis, Thyroid, Tonsil, Uterus, Whole embryo, breast, colon, genitourinary tract, head neck,	Actin-binding protein important in organization of cytoskeleton and in cell adhesion. "The cytoplasmic localization of actinin-4 was closely associated with an infiltrative histological phenotype and correlated significantly

FIGURE 31B

					lung, cell line, ovary, stomach	with a poorer prognosis in 61 cases of breast cancer" [J.Cell.Biol. 1998, 140(6):1383-93]. Alpha-actinin-1 and 4 associate with PDZ domain of CLP-36 PDZ-LIM protein (also called hCLIM1 - high expression in epithelial cells) in actin stress fibers [JBC 2000, 275(15):11100-11105].
22.8D11 μ,λ	Human clathrin coat assembly protein 50 (AP50) m RNA	See Fig. 35	49662	WLAAVTKQNV (64-73) ILPFRVPLV (284-293) SLLAQKIEV (314-322) KLNYSDDHV (410-418)	infant brain, brain, placenta, breast, ovary (tumor), fetal heart, fetal lung, multiple sclerosis lesions, pineal gland, lymph node	Component of the adaptor complexes which link clathrin to receptors in coated vesicles clathrin-associated protein complexes are believed to interact with the cytoplasmic tails of membrane proteins, leading to their selection and concentration. AP50 is a subunit of the plasma membrane adaptor.
27.B1 μ,κ 27.F7 μ,κ	Homo sapiens GLUT1 C-terminal binding protein (GLUT1CBP) mRNA [GIPCTIP-2]	See Fig. 36	36047	KLLGGQIGL (111-119) SLLGCRHYEV (185-194)	Adipose, Aorta, Blood, Bone, Brain, Breast, CNS, Colon, Germ Cell, Heart, Kidney, Lung, Ovary, Pancreas, Placenta, Pooled, Stomach, Testis, Thymus, Uterus, Whole embryo, brain, breast, colon, connective tissue, lung, muscle	Binds via a PDZ domain to C terminus of GLUT1 and interact with cytoskeletal proteins
33.2H6 μ,λ	Homo sapiens gp130 associated protein GPM mRNA	See Fig. 37	21835	YLSQEHHQQV (94-103)	placenta, breast, infant brain, uterus (pregnant), B-Cell, ovary (tumor), fetal heart, fetal liver/spleen, fetal lung, T cells (Jurkat cell line)	Has a possible role in the negative regulation of proteins containing WD-40 repeats. May be required for the initiation and maintenance of the differentiated state.

FIGURE 31C

33.2H6 μ,λ	Homo sapiens amino-terminal enhancer of split (AES) mRNA	See Fig. 38	21966	YLSQEHQQQV (95-104)	Adrenal gland, Aorta, Blood, Bone, Brain, Breast, CNS, Colon, Esophagus, Eye, Foreskin, Germ Cell, Head and neck, Heart, Kidney, Lung, Lymph, Muscle, Nose, Ovary, Pancreas, Parathyroid, Placenta, Pooled, Prostate, Spleen, Stomach, Synovial membrane, Testis, Thymus, Thyroid, Tonsil, Uterus, Whole embryo, brain, colon, head, neck, kidney, lung, ovary, pnet.	Amino-terminal enhancer of split is similar to the Drosophila enhancer of split groucho protein. The function of AES has not been determined but it has been proposed as a candidate tumor human cancer antigen.
33.2H6 μ,λ	Antiquitin 1 (antiquitin-26g turgor protein homolog), mRNA	See Fig. 39	55357	KVMDRPGNYV (372-381) ALIEQWNPV (149-157) IITAFNFPV (162-170)	fetal heart, infant brain, placenta, NT2 neuronal precursor, liver, HeLa (cell line), ovary, liver (HepG2 cell line), ovary (tumor), multiple sclerosis lesions	Unknown (30% identity to various eukaryotic and prokaryotic aldehyde dehydrogenases). Antiquitin has homology to a previously described protein from the green garden pea, the 26g pea turgor protein. Four human antiquitin-like sequences, possibly pseudogenes, have also been identified.
39.A7 μ,λ	ARP2/3 protein complex 41 KD subunit (P41-ARC), mRNA	See Fig. 40	40935	FEQENDWWV (125-133)	HeLa (cell line), fibroblast, fetal brain, infant brain, fetal liver/spleen, monocytes (stimulated), fetal heart, uterus (pregnant), olfactory epithelium, breast	Part of a complex implicated in the control of actin polymerization in cells belongs to a complex composed of ARP2, ARP3, P41-ARC, P34-ARC, P21-ARC, P20-ARC and P16-ARC.
50.1B3 μ,κ	H.sapiens seb4D mRNA H.sapiens seb4B mRNA	See Fig. 41a and 41b	seb4D-24617	for seb4D YLGAKPWCL (100-108) CLQTGFAIGV (107-116)	thymus, Blood, Brain, Breast, Colon, Germ Cell, Heart, Kidney, Lung, Lymph, Ovary, Parathyroid, Pooled, Prostate, Testis, Thymus, Tonsil, Uterus, brain, colon, lung, muscle, ovary,	Unknown

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FIGURE 31D

			seb4B- 25218	for seb4B YLGAKPWCL (101-109) CLQTGFAIGV (108-117)	stomach, thymus, pooled, whole blood	
59.3G7 μ , λ	Homo sapiens lamin A/C (LMNA) mRNA	See Fig. 42	65133	KLLEGEERL (378-387) KLVRSVTVV (542-550) RLADALQEL (240-248)	Adipose, Adrenal gland, Bone, Brain, Breast, Colon, Esophagus, Foreskin, Germ Cell, Heart, Kidney, Larynx, Liver, Lung, Lymph, Muscle, Ovary, Pancreas, Parathyroid, Placenta, Pooled, Prostate, Spleen, Stomach, Synovial membrane, Testis, Thymus, Thyroid, Uterus, Whole embryo, brain, breast, colon, denis_drash, head_neck, lung, cell line, ovary, stomach	Intermediate filament proteins

FIGURE 32A

Human mRNA for KIAA0338 gene, partial cds

Origin	1	catcagcggg	cgggggtgtc	gccgaacagg	ctgtccgca	gagcccgcg	cgacccgcg
	61	ccgccccgcc	ccgcgccctg	cctgccagag	gagccgaggg	ggccgcccct	cgcccaacct
	121	gcccgacatg	gggaaccccg	ggcccaggcg	tgctggtcac	catgacaaca	gagacaggcc
	181	ccgactctga	ggtgaagaaa	gctcaggagg	aggccccgca	gcagcccag	gctgctgccc
	241	ctgtgaccac	ccctgtgacc	cctgcaggcc	acggccaccc	agaggccaac	tccaatgaga
	301	agcatccatc	ccagcaggac	acgcggcctg	ctgaacagag	cctagacatg	gaggagaagg
	361	actacagtga	ggccgatggc	ctttcggaga	ggaccacgcc	cagcaaggcc	cagaaatcgc
	421	cccagaagat	tgccaagaaa	tacaagatg	ccatctgccg	ggtcactctg	cttgatgcct
	481	cggagtatga	gtgtgagggtg	gagaaacatg	gccggggcca	ggtgctgttt	gacctggtct
	541	gtgaacacct	caacctccta	gagaaggact	acttcggcct	gaccttctgt	gatgctgaca
	601	gccagaagaa	ctggctggac	ccctccaagg	agatcaagaa	gcagatccgg	agtagccccct
	661	ggaattttgc	cttcacagtc	aagtcttacc	cgcctgatcc	tgcccagctg	acagaagaca
	721	tcacaagata	ctacctgtgc	ctgcagctgc	gggcagacat	catcacgggc	cggctgccat
	781	gctcctttgt	cacgcattgc	ctactgggct	cctacgctgt	gcaggctgag	ctgggtgact
	841	atgatgctga	ggagcatgtg	ggcaactatg	tcagcgagct	ccgcttcgcc	cctaaccaga
	901	cccgggagct	ggaggagagg	atcatggagc	tgcataagac	atataggggg	atgacccccg
	961	gagaagcaga	aatccacttc	ttagagaatg	ccaagaagct	ttccatgtac	ggagttagacc
	1021	tgaccattgc	caaggactct	gagggcattc	acatcatgtt	aggcgtttgt	gcbaatggcc
	1081	tgctcatcta	ccgggaccgg	ctgagaatca	accgctttgc	ctggcccagg	atcctcaaga
	1141	tctcctacaa	gaggagtaac	ttctatatca	agatccggcc	tgggggagtat	gagcaatttg
	1201	agagcacaaat	tggttttaag	ctcccaaacc	accggtcagc	caagagactg	tggaaggctt
	1261	gcacgagca	tcatacatc	ttccggctgg	tgtcccccta	gccccacccc	aagggtttcc
	1321	tggtgatggg	ctccaagttc	cgggtacagt	ggaggacccta	ggcacagact	cgccaggcca
	1381	gcgccctcat	tgaccggcct	gcacccttct	ttgagcgttc	ttccagcaaa	cggtaacca
	1441	tgtcccgcag	ccttgatgga	gcagagtctt	cccggccagc	ctcgggtcag	gagaaccatg
	1501	atgcaggggc	tgacggtgac	aagcgggatg	aggatggcga	gtctgggggg	caacgggtcag
	1561	aggctgagga	gggagaggct	aggactccaa	ccaagatcaa	ggagctaaag	ccggagcagg
	1621	aaaccacgcc	gagacacaag	caggagtctt	tagacaagcc	agaagatgtc	ttgctgaagc
	1681	accaggccag	gatcaatgag	ctcaaaagg	ccctgaagga	gcccacagc	aaactcatcc

FIGURE 32B

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1741 accgggatcg agactgggaa cgggagcgca ggctgccctc ctccccgc ccctcccc tccccctccc
1801 ccaagggcac ccctgagaaa gccaatgaga gagcagggct gaggagggc tccgaggaga
1861 aagtcaaac accacgtccc cgggccccag agagtgcac accacctggc aggcgatgag gaccaggacc
1921 aggagagggg cacgggtgtt ctgaaggaca accacctggc cattgagcg cactgtggtg
1981 gcatcacggt cagctctacg tctagcctgg aggtgaggt gacttcacg gactgtggtg
2041 actaccatgg cagcgccctt gaagacttct cccgcagcct gcctgagctc gaccgggaca
2101 aaagcgactc ggacactgag ggcctgctgt tctcccgga tctcaacaag ggggccccca
2161 gccaggatga tgagtctggg ggcattgagg acagcccga tcgaggggcc tgcctccacc
2221 cgatatgcc ccagtttgag ccgtgaaa cagaaaccat gactgtcagc agtctggcca
2281 ttagaaagaa gattgagccg gggccgtac tgcagaccag agtctccgt atggataaca
2341 ccagcaggt tgatgggagt gccctcagt ggagggagt catagcaacc actccccca
2401 tcaccacgga gaccatatcg accaccatgg agaacagtct caagtccggg aagggggcag
2461 ctgccatgat ccaggccca cagacggtgg ccacggaaat ccgttctctt tctccgatca
2521 tcgggaaaga tgtcctcacc agcacctacg gcgcactgc ggaaccctc tcaaccctca
2581 ccaccacca tgtaaccaa actgtgaaag gagggttttc tgagacaagg atcgagaagc
2641 gaatcatcat tactggggat gaagatgtcg atcaagacca ggcctgggt ttggccatca
2701 aggaggccaa actgcagcat cctgatatgc tggtaaccaa agctgtcgt tacagagaaa
2761 cagacccatc ccagaggag agggacaaga agccacagga atcctgacct ctgtgaagag
2821 atcctggcat ttctggtcca acccaagcca gagaaccatt aagaaggggc cttcatctcg
2881 gattctccga cgcaacactg acgtcccagc tgcgacgtac tgtcactgat gagagactgg
2941 gaaaggaaaa gcatatatat atagatatat agagatatag atatatatag agaaaacc

```

FIGURE 32C

3001 gcaccccttg actgctgctg gggctggcag agcagttggc tgacagcaac aaccgacatc
 3061 tgaacaccta catttccttt gcagacaaat tgaagaactg gtgggatttt ttcaagaaa
 3121 aaaaattata taataactat aatcccttgc tcacccttt ccccgcaa ataagaaacg
 3181 caagccagac cagatgatt gtagaagtcc ctcccgccct ggttctgcac gttacagtta
 3241 gcagacgagc aattccattt gttcttctcc agcatctcta aggccactt gaatgcaaaag
 3301 gaaacactt gcacagcaa gcaagagaag tcacagcagc aagacacgca cagtcaacca
 3361 ttttccgaga aaaaagaaa attccccact tggaaaagaaa gaggaggaac actggattctt
 3421 tactttctgg atcttgacac tgggctgcaa aacctacctt cctctctcc gcctccccctc
 3481 accctcaact ctcaatgtct tgctgtcatt ttctgtctcg gctccctcct ccccttccc
 3541 ccttccccca cccacaccc ttacccctct gtgtcctggt ccttctgagg gccactgcag
 3601 atgactctcc ttgaaatga gaaaaagaaa agaaagcaag aacagaaaaac gaagccacag
 3661 gaagggaagt agacattgta tgcttatggt ttctcattat gaaggtgcag cttgtaggag
 3721 gtttgtagcg atgtgctttg aagttatgta tattacatat aacaggaaaa aatatttaata
 3781 aacagtgcg gtaagtatga agctgacatt ctaaaattat aattatctga ctgtgattga
 3841 tgtatcctga ggttcctaga tctcactgaa ctggcccagc taaggagacc tggactctgg
 3901 gtgtgggttg gctcacagta ggggctgacg ggttcagtgt agtaatactg tgtgtggtgt

FIGURE 32D

3961 ttgtaattgg ttgattggtg gggagggggtg gggggcccta atggagaggt grgggttggg
 4021 caagaaagaa gcaacacaga tgtgtcccc aaatgccag ttcaagacac cttctcccctg
 4081 cccccctggt agtaacagtc agggcctggt ctgtgtcag gtactgggtc ccagtctggg
 4141 actctgctgc tgaagttgcc acagtagagg tccctggctt agtccttacc tccctacggg
 4201 gcttgccttg gttttcagtc ttctctctct ttctctcttt ttttttttt tgccacattc
 4261 tgcccttccc tgaccccat gtaataacca actccatata caaaggaggg tgggtgctctc
 4321 agccattgta gaagatggtg gctttaacct gactgtctaa aaattcccag ctaagccttt
 4381 tcctctactc tcctccttgt tctgaatcat ttcttcttct caggccaaag tagccatggt
 4441 aaggaggctt catggggcag accctgaaag atcaaaactg catttgcaaa gccctccccct
 4501 gtcccaggac aaagctgaga ctgacgggtg atgttgctca taggctccag ctctgcataa
 4561 gaccttggct tggagacctc cctctcagtc aacagctgaa ctctgagctt gtgcccagaa
 4621 attaccccaa gaccacagga acccttcaag aagctcccat cacaagcttg gcattgctct
 4681 ctgccacacg tgggcttctt caggcttgtc tgccacaagc tacttctctg agctcagaaa
 4741 gtgcccccttg atgagggaaa atgtccact gactgcgaa ttctcagtt ccattttacc
 4801 tcccagtcct ccttctaacc cagttataaa attcattcca caagtattta ctgattacct
 4861 gcttgtgcca gggactattc tcagggtgaa gaaggtggga ggggagggcg gaacctgagg
 4921 agccacctga gccagcttta tatttcaacc atggctggcc catctgagag catctcccca
 4981 ctctcgccaa cctatcgggg catagccccc ggatgcccc aggcggccca ggttagatgc
 5041 gtcccttttg ctgtcagtg atgacataca ccttagctgc ttagctggtg ctggcctgag
 5101 gcagggcagg aaatcagaat agcatttgc tctctgggca aatgggaagt tcagcggggc

FIGURE 32E

5161 agcagaatca gtggcattcc ccctgggtgca ggcgggtggg tccactccaa ctccccctga
 5221 gtgtagcagc acactttcca tacaccaggt tctttctaca atcctgggtg aaaagccaca
 5281 gaaccttctt cctgcccttc ttgagagttc ccctctttc tgggtcaaga gctggagtgg
 5341 tggctccatc ctctctgggc cacttcggtc taggaactca tctttgcagg aaccaggagt
 5401 cctgagcaca ctgaacacac ctgagaggga ggtcccttgt tgtggatttt gcacctggct
 5461 ttggggcagg ggtgaagtga ccaggcttag cttgtggagt ttatgggcca ccagggtttg
 5521 gggaaatcac catccgcgg atgctgtgac ctcccttcta cggagatgca ggcagtgcc
 5581 cgaggaggga ggggacctgc aaagctagaa tctagggcac tgtttcctcc ccaccttct
 5641 ctttgttaga aatagagacg ttgtcttgt ctgtcttcaa cctacttttc cttttctctt
 5701 ttttgtttct catcctctct gtgccacctc tccaccagg aggccatgta gcatagtga
 5761 aaaagtccct gagggcggtt aggagttctg ggtgaccatc ctggctcagc tcctaactca
 5821 ccatgtgaca tcaggctatc ccattcccc ctcttgggcc tcagtttccc gacttgcaaa
 5881 ataagcagaa agaaccagat gctctccagg gtcttttct actttgctat ctcatgggtc
 5941 ttcattttct cttattttgt tttctctgga tcttttccat ctgaggggtac aggaagtacc
 6001 aggacctgtt tcagtttttg aatcctgcaa gcacattcca agactggcct gaaactgcat
 6061 gagcaacatc actcgaaata attttttt tcaaaagcac cttacaacc aattgcgatg
 6121 ctgtcctgtt cctttttact cacacccttc tctcttttct cctcccato ctccccacc
 6181 tcagtgtctc gtgctgtatg cgtgtgtctt ctgttcttgt atactcaata taagtgaat
 6241 aaatgtgtt gatgctgaac cat

FIGURE 32F

Translation :

SAGGVAEQAAPOSPPRPRAAPPRLPARGAEGAAPRPTCTWGTGPGVLVTMTTET
 GPDSEVKKAQEEAPQQPEAAAAVTPVTPAGHGHPEANSNEKHPSQQDTRPAEQSLDM
 EEKDYSEADGLSERTTPSKAQKSPQIAKKYKSAICRVTLDDASEYECEVEKHGRGQV
 LFDLVCEHLNLEKDYFGLTFCDADSQKNWLDPSKEIKKQIRSSPWNFAFTVKFYPPD
 PAQLTEDITRYYLCLQLRADIIITGRLPSCSFVTHALLGSYAVQAEELGDDYDAEEHVGNVY
 SELRFAPNQTRLEERIMELHKTGRGMPGEAEIHFLAKKLSMYGVDLHHAKEGSEG
 IDIMLGVCANGLLIYRDLRLINRFAWPKILKISYKRSNFYIKIRPGEYEQFESTIGFK
 LPNHRSAKRLWKVCIEHHTFFRLVSPPEPPKPGFLVMGSKFRYSGRTOAQTRQASALID
 RPAPFFERSSSKRYTMSRSLDGAEFSPASVSENHDAGPDGDKRDEGESGGORSEAE
 EGEVRTPTKIKELKPEQETTPRHKQEFLLDKPEDVLLKHQASINELKRTLKEPNSKLIH
 RDRDWERERRLPSSPASPSPKGTPEKANERAGLREGSEEEKVKPPRPAPESDTGDEDQ
 DQERDTVFLKDNHIAIERKCSSITVSSSTSSLEAEVDFTVIGDYHGSAFEDFSRSLPEL
 DRDKSDSDTEGLLFSRDLNKGAPSDDESGLIEDSPDRGACSTPDMPOFEPVKTETMT
 VSSLAIRKKIEPEAVLQTRVSAMDNTQQVDGSASVGREFIATTPSITTETIISTTMENS
 LKSGKGAAAMI PGQTVATEIRSLSPIIGKDVLTSTYGATAETLSTSTTHVTKTVKG
 GFSETRIEKRIIITGDEDVDQOALALAIKEAKLQHPDMLVTKAVVYRETDPSPPEED
 KKPQES

FIGURE 33A

Human non-muscle alpha-actinin mRNA, complete cds -
the second non-muscle alpha-actinin isoform designated ACTN4 (actinin-4)

ORIGIN

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1  gcgcgccggc ggctcgggca gaggggcggg agctgaggcg ggagcggaca ggctgggtggg
61  cgagcgagag gcgcggaatg gtggactacc acgcggcgaa ccagtcgtac cagtacggcc
121 ccagcagcgc ggcaatggct tggcggcggg ggagcatggg cgactacatg gcccaggagg
181 acgactggga ccgggacctg ctgctggacc cggcctggga gaagcagcag cgcaagacct
241 tcacggcatg gagcaactcc cacctgcgga aggcaggcac acagatcgag aacattgatg
301 aggacttccg agacgggctc aagctcatgc tgctcctgga ggtcatatca ggggagcggg
361 tacctaagcc ggagcggggg aagatgagag tgcacaaaat caacaatgtg acaaaagcgc
421 tggactttat tgcagcaaaa gggatcaagc tggacttcca tcgggcagaa gagattgtgg
481 acggcaacgc aaagatgacc ctgggaatga tctggaccat catccttagg ttcgccatcc
541 aggacatctc cgtggaagag acctcggcca aggaagggtt ctttctctgg tgccagagaa
601 agacagcccc atataagaac gtcaatgtgc agaacttcca catcagctgg aaggatggtc
661 ttgcccttcaa tggcctgata caccggcaca gaccagagct gattgagtat gacaagctga
721 ggaaggacga ccctgtcacc aacctgaaca atgccttcga agtggctgag aaatacctcg
781 acatccccc aaatgctggat gcagaggaca tcgtgaacac ggcgcggccc gacgagaagg
841 ccataatgac ctatgtgtcc agcttctacc atgccttttc aggagcgcag aaggctgaaa
901 ctgaaactgc cgccaaccgg atctgtaagg tgctggctgt caaccaagag aactgcagca
961 cctcgatgga ggactacgag aagctggcca gcgacctctt ggagtggatc cggcgcacca
1021 tcccctggct ggaggaccgt gtgccccaaa agactatcca ggagatgcag cagaagctgg
1081 aggacttccg cgactaccgg cgtgtgcaca agccgccc aa ggtgcaggag aagtgccagc
1141 tggagatcaa cttcaacagc gtgcagacca agctgcgcct cagcaaccgg ccgccttca
1201 tggcctccga gggcaagatg gtctcggaca tcaacaatgg ctggcagcac ttggagcagg
1261 ctgagaaggg ctacgaggag tggctgctga atgagattcg caggctcgag cggctcgacc
1321 acctggcaga gaagtctccg cagaaagcct ccatccacga ggctggact gacgggaagg

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FIGURE 33B

1381 aagccatgct gaagcaccgg gactacgaga cggccacact atcggacatc aaagccctca
 1441 ttcgcaagca cgaggccttc gagagcgacc tggctgcgca ccaggaccgc gtggagcaga
 1501 tcgccgcctc cgccaggag ctcaacgagc tggattacta cgactccac aatgtcaaca
 1561 cccggtgcc aagatctgt gaccagtggg acgccctcgg ctctctgaca catagtgcga
 1621 gggaagccct ggagaaaaca gagaagcagc tggaggccat catcgaccag ctgcacctgg
 1681 aatacgccaa gccgcggcc ccctcaaca actggatgga gagcgccatg gaggaccctcc
 1741 aggacatgtt catcgtccat accatcgagg agattgaggg cctgatctca gcccatgacc
 1801 agttcaagtc caccctgccg gacgccgata gggagcgga ggcctcctg catccacaag
 1861 gaggccagag gatcgctgag agcaaccaca tcaagctgtc gggcagcaac ccctacacca
 1921 ccgtcacccc gcaaatcatc aactccaaat gggagaaggc gcagcagctg gtgccaaaac
 1981 gggaccatgc cctcctggag gagcagagca agcagcagca gtccaacgag cactgcgcc
 2041 gccagtctgc cagccaggcc aatgttgtgg ggccttggat ccagaccaag atggaggaga
 2101 tcgcgatctc cattgagatg aacgggaccc tggaggacca gctgagccac ctgaagcagt
 2161 atgaacgcag catcgtggac tacaagccca acctggacct gctggagcag cagcaccagc
 2221 tcatccagga ggcctcatc ttcgacaaca agcacacca ctataccatg gagcacatcc
 2281 gcgtgggctg ggagcagctg ctacaccaca ttgcccgcac catcaacgag gtggagaacc
 2341 agatccttac ccgcagcgc aagggcatca gccaggagca gatgcaggag ttccgggctg
 2401 ccttcaacca cttcgacaag gatcatggcg gggcgctggg gcgaggagtt caaggcctgc
 2461 ctcatcagcc tgggctacga cgtggagaac gaccggcagg tgaggccgag ttcaaccgca
 2521 tcatgagcct ggtcgacccc aaccatagcg gccttgttac ctccaagcc ttcatcgact
 2581 tcatgtcgcg ggagaccacc gacaccgaca cggctgacca ggtaatcact tccttcaagg

FIGURE 33C

2641 tcctagcagg ggacaagaac ttcatcacag ctgaggagct gcggagagag ctgccccccg
 2701 accaggccga gtactgcac gccgcgatgg cgccatacca ggcccctgac ggcgtgcgcg
 2761 gtgccctcga ctacaagtcc ttctccacgg ccttgtagtg cgagagcgac ctgtgaggcc
 2821 ccagagacct gacccaacac cccgacgccc tccaggagcc tggcagcccc acagtcccat
 2881 tcctccactc tgtatctatg caaagcactc tctctgcagt ctccgggggtg ggtgggtggg
 2941 cagggagggg ctggggcagg ctctctctc tctctctttg tgggttgccc aggaggttcc
 3001 ccgaccagg ttggggagac ttggggccag cgcttctggt ctggtaaata tgtatgatgt
 3061 gttgtgcttt tttaaccaag gaggggccag tggattccca cagcacaacc ggtccccttc
 3121 atgccctggg atgcctcacc acaccagggt ctcttccttt gctctgaggt cccttcaagg
 3181 cctccccaat ccaggccaaa gcccctatgt ccttggtccag ggaactgcct ggcccatgcg
 3241 aggggccagc agaggcgcc accacctgac ggtggggacc caccagccc ctctcccctc
 3301 tctgctccag actcacttgc cattgccagg agatggcccc aacaagcacc ccgcttttgc
 3361 agcagaggag ctgagttggc agaccgggcc cccctgaacc gcaccccatc ccaccagccc
 3421 cggccttgct ttgtctggcc tcacgtgtct cagattttct aagaacccaaa aaa

FIGURE 33D

Translation:

MVDYHAAHQSYQYGPSSAAMAWRRGSMGDYMAQEDDWRDRLLLDPAWEKQQRKFTAW
SNSHLRKAGTQIENI DEDFRDGLKMLLLEVISGERLPKPERGKMRVHKINNWNKALD
FIASKGIKLDHFHRAEEIVDGNAKMTLGMWITIILRFAIQDISVEETSAKEGLLLWCQR
KTAPYKNVNVQNFHISWKDGLAFNALIHRHRPELIEYDKLKRKDDPVTNLNNAFEVAEK
YLDIPKMLDAEDIVNTARPDEKAIMTYVSSFYHAFSGAQKAETETAAANRICVKVLAVNQ
ENCSTSMEDYEKLASDILLEWIRRTIPWLEDVRVPQKTIQEMQQKLEDFRDYRRVHKPPK
VQEKQLEINFNSVQTKLRLSNRPAPFMPSEGKMSVDINNNGWQHLEQAEKGYEEWLLNE
IRRLERLDHLAEKFRQKASIHEAWTDGKEAMLKHRDYETATLSDIKALIRKHEAFESD
LAHQDRVEQIAASAQELNELDYDSHNVNTRCQKICQWDALGSLTHSRREALEKTE
KQLEAII DQLHLEYAKPAAPFNNWMESAMEDLQDMFIVHTIEEIEGLISANDQEKSTL
PDADREERAILHPQGGORIAESNHIKLSGSNPYTTVTPQI INSKWEKVQQLVPKRDHA
LLEEQSKQQQSNELRRQFASQANVVGPMIQTKEEIAISIEMNGTLEDQLSHLKQYE
RSIVDYKPNLDLLEQQHQLIQEALIFDNKHTNYTMEHIRVCGWEQLTTIARTINEVEN
QILTRDAKGISQEQMQEFASFNFHFDKDHGGALGRGVQGLPHQPGLRGGERPAGEAEF
NRIMSLVDPNHSGLVTFOAFIDFMSRETTDTADQVITSFKVLAGDKNFITAEELRR
ELPPDQAEYCIARMAPYQGPDGVRGALDYKSFSTALYGESDL

FIGURE 34A

Homo Sapiens actinin, alpha 4 (ACTN4) mRNA

Origin	1	61	121	181	241	301	361	421	481	541	601	661	721	781	841	901	961	1021	1081	1141	1201	1261	1321	1381	1441	1501	1561	1621	1681	1741	1801																																																																																																																																												
	cgcgccgcg	tcgacctacc	acgcggcgaa	ccagtcgtac	cagtacggcc	ccagcagcg	gggcaatggc	gctggcggcg	gggcagcat	gggcgactac	atggcccagg	aggacgactg	ggaccgggac	ctgctgctgg	acccggcctg	ggagaagcag	cagcgcaaga	ccttcacggc	atggtgcaac	tccacactgc	ggaaggcagg	cacacagatc	gagaacattg	atgaggactt	ccgagacggg	ctcaagctca	tgctgctcct	ggaggtcata	tcaggggagc	ggttacctaa	gccggagcgg	ggaagcaca	gtgaacaaag	cgctggactt	tattgccagc	aaaggcgtca	agctggcttc	catcggggca	gaagagattg	tgacgggcaa	cgcaaaagatg	accctgggaa	tgatctggac	catcatcctt	aggttcgcca	tcacggacat	ctccgtggaa	gagacctcgg	ccaagggaag	gctccttctc	tygtgccaga	gaaagacagc	cccgtataag	aacgtcaatg	tcacatcagc	tggaaggatg	gtcttgcctt	caatgccctg	atccaccggc	acagaccaga	gctgattgag	tatgacaagc	tgaggaaagg	cgacctgtc	accaacctga	acaatgcctt	cgaagtggct	gagaaatacc	tcgacatccc	caagatgctg	gatgcagagg	acatcgtgaa	cacggccccg	cccgacgaga	aggccataat	gacctatgtg	tccagcttct	accatgcctt	tcaggagcg	cagaaggctg	aaactgccgc	caaccggatc	tgtaaggctg	tggtgtgcaa	ccaagagaac	gagcacctga	tgaggagcta	cgagaagctg	gccagcgacc	tcctggagtg	gatccggcgc	accatccccct	ggctggagga	ccgtgtgccc	caaaagacta	tcaggagat	gcagcagaag	ctggaggact	tcgcgacta	ccggctgtg	gacatcaaca	atggctggca	gcacttggag	caggctgaga	agggtctacga	ggagtggctg	ctgaatgaga	tcgcaggct	ggagcggctc	gaccacctgg	cagagaagtt	ccggcagaaag	gcctccatcc	acgaggcctg	gactgacggg	aaggaaagcca	tgctgaagca	ccgggactac	gagacggcca	cactatcgga	catcaagcc	ctcattcgca	agcacgaggc	cttcgagagc	gacctggctg	cgacaccagga	ccgctggag	cagatcgccg	ccattgcccc	ggagctcaac	gagctggatt	actacgactc	ccacaatgtc	aacacccggc	gccagaagat	ctgtgaccag	tgggacgccc	tcggctctct	gacacatagt	cgcaggggaag	ccctggagaa	aacagagaaag	cagctggagg	ccatcgacca	gctgcacctg	gaatacgcca	agcgcgcggc	ccccttcaac	aactggatgg	agagcgccat	ggaggacctc	caggacatgt	tcatacgtcca	taccatcgag	gagattgagg	gcctgatctc	agcccatgac	cagttcaagt	ccaccctgcc	ggacgcccgat	aggagcgcg	agccatcctt	ggccatccac	aaggaggccc	agaggatcgc	tgagagcaac	cacatcaagc	tgtcggggcag	caaccctac	accaccgtca	ccccgcaaat

FIGURE 34B

```

1861 catcaactcc aagtgggaga aggtgcagca gctggtgcc aacgggacc atgccctcct
1921 ggaggagcag agcaagcagc agtccaacga gcacctgcgc cgccagtctg ccagccaggc
1981 caatgttgtg ggcccttggg tccagaccaa gatggaggag atcggggcga tctccattga
2041 gatgaacggg accctggagg accagctgag ccacctgaag cagtatgaac gcagcatcgt
2101 ggactacaag cccaacctgg acctgctgga gcagcagcac cagctcatcc aggaggccct
2161 catcttcgac aacaagcaca ccaactatac catggagcac atccgcgtgg gctggggagca
2221 gctgctcacc accttgccc gcaccatcaa cgaggtggag aaccagatcc tcaccgcga
2281 cgccaagggc atcagccagg agcagatgca ggagttccgg gcgtccttca accacttcga
2341 caaggatcat ggcgggggcg tggggcccga ggagttcaag gcctgccctca tcagccctggg
2401 ctacgacgtg gagaacgacc ggcaagggtga ggcgagttc aaccgcatca tgagccctggt
2461 cgaccccaac catagcggcc ttgtgacctt ccaagccttc atcgacttca tgtcgcggga
2521 gaccaccgac acggacacgg ctgaccagggt catcgcttcc ttcaaggctt tagcagggga
2581 caagaacttc atcacagctg aggagctgcy gagagagctg ccccccgacc aggccgagta
2641 ctgcatcgcc cgcattggcg cataccaggg ccctgacgcc gtgccccgtg ccctcgacta
2701 caagtccttc tccacggcct tgtatggcga gacgacacctg tgaggcccca gagacctgac
2761 ccaacacccc cgacggcctc caggaggggc ctgggcagcc ccacagtcctc attcctccac
2821 tctgtatcta tgcaaagcac tctctgcagt cctccggggt gggtgggtgg gca

```

FIGURE 34C

Translation:

MGDYMAQEDDWRDRLLLDPAWEKQQRKFTTAWCNHLRKAGTQIENIDEDFRDGLKMLL
 LEVISGERLPKPERGKMRVHKINNUNKALDFIASKGVKLVSIGAEIIVDGNAKMTLGMW
 TIILRFAIQDISVEETSAKEGLLLWCQRKTAPYKNVNVQNFHISWKDGLAFNALIHRHRP
 ELIEYDKLRKDDPVTNLNNAFEVAEKYLDIPKMLDAEDIVNTARPDEKAIMTYVSSFYHA
 FSGAQKAETAANRICKVLAVNQENEHLMEDYEKLASDLLEWIRRTIPWLEDRVPOKTIQE
 MOQKLEDFRDYRRVHKPPKVQEKCCQLEINFNTLQTKLRLSNRPAFMPSEGMVSDINNGW
 QHLEQAEKGYEELLNEIRRLERLDHLAEKFRQKASIHEAWTDGKEAMLKHRDYETATLS
 DIKALIRKHEAFESDLAAHQDRVEQIAAIAQELNELDYDSSHVNTRCQKICDQWDALGS
 LTHSRREALEKTEKQLEAIDQLHLEYAKRAAPFNWMMESAMEDLQDMFIVHTIEEIEGLI
 SAHDQFKSTLPDADREREAILAIHKEAQRIAESNHIKLSGSNPYTTVTPQIINSKWEKVQ
 QLVPKRDHALLEEQSKQSQSNEHLRRQFASQANVVGPIQTKMEEIGRISIEMNGTLEDQL
 SHLKQYERSIVDYKPNLDLLEQQHQLIQEALIFDNKHTNYTMEHIRVGVGEQLTTIARTI
 NEVENQILTRDAKGISQEQMQEFRA SFNFHFDKDHGGALGPPEEFKACLISLGYDVENDRQG
 EAEFNRMISLVDPNHSGLVTFQAFIDFMSRETTDTDTADQVIASFVKVLAGDKNFITAEEL
 RRELPPDQAEYCIARMAPYQGPDAVPGALDYKSFSTALYGESDL

FIGURE 35A

CLATHRIN COAT ASSEMBLY PROTEIN AP50

ORIGIN

```

1  caggctctgtt ctcagagcga tgggcccgcag agactgatct gccgccatga ttgaggctt
61 attcatctat aatcacaagg gggaggtgct catctcccga gtctaccgag atgacatcgg
121 gaggaacgca gtggatgcct ttcggttcaa tgttatccat gccgggcagc aggtgcgcag
181 cccggtcacc aacattgctc gcaccagctt ctccacggtt aagcgggtcca acatttggct
241 ggcagcagtc accaagcaga atgtcaacgc tgccatggtc ttcgaaattcc tctataagat
301 gtgtgacgtg atggccgctt actttggcaa gatcagcgag gaaaacatca agaacaattt
361 ttgtctcata tatgagctgc tggatgagat tctagacttt ggtacccac agaattccga
421 gacaggcgcg ctgaaaacct tcatacgcga gcagggcac aagagtcagc atcagacaaa
481 agaagagcag tcacagatca ccagccaggt aactgggcag attggctggc ggcgagaggg
541 catcaagtat cgtcggaaatg agctcttctt ggatgtgctg gagagtgtga acctgctcat
601 gtcccacaaa gggcagggtgc tgagtgccta tgtgtcgggc cgggtggtga tgaagagcta
661 cctgagtggc atgacctgaat gcaagtttgg gatgaatgac aagattgtta ttgaaaagca
721 gggcaaaagg acagctgatg aaacaagcaa gagcgggaag caatcaattg ccattgatga
781 ctgcaccttc caccagtgtg tgcgactcag caagtttgac tctgaacgca gcatcagctt
841 tatcccgcga gatggagagt ttgagcttat gaggtatcgc acaaccaagg acatcatcct
901 tcccttcggg gtgatcccg gtgtgcgaga agtgggacgc accaaactgg aggtcaaggt
961 atcatcaao tccaaactta aacctact actnnctcag aanaatnann tnannatccc

```

FIGURE 35B

1021 aacccactg aacacaagcg ggggtgcaggt gatctgcatg aagggaagg ccaagtacaa
 1081 ggccagcgag aatgccatcg tgtggaagat caagcgcatg gcaggcatga aggaatcgca
 1141 gatcagcgca gagattgagc ttctgcctac caacgacaag aagaaatggg ctcgaccccc
 1201 catttccatg aactttgagg tgccattcgc gccctctggc ctcaaggtgc gctacttgaa
 1261 ggtgtttgaa ccgaagctga actacagcga ccatgatgtc atcaaatggg tgcgctacat
 1321 tggccgcagt ggcatttatg aaactcgtg ctagctgcca ctaggcagct agcccacctc
 1381 ccagccacc ctctccaca ggtccagggt cgcctccctc cccaccaca catcagtgtc
 1441 tcctccctcc tgctttgctg ccttcccttt gcaccagccc gagtctaggt ctgggccaag
 1501 cacattacaa gtgggaccgg tggagcagcc cctgggctcc ctgggcaggg gagtctgag
 1561 gctcctgctc tcccatccac ctgtctgtcc tggcctaag ccaggctctg agttctgtga
 1621 ccaaagccag gtgggttccc ttctctccc acccctgtgg ccacagctct ggagtgggag
 1681 ggttggttgc ccctcacctc agagctcccc caaaggccag taatggatcc cgggcctcag
 1741 tccctactct gctttgggat agtgtgagct tcattttgta cacgtgttgc ttcgtccagt
 1801 tacaaccaca ataaactctg tagagtgg

FIGURE 35C

Translation:

MIGGLFIYNHKGVLISRVYRDDIGRNAVDVAFRVNVIHARQQVRSPVTNIARTSFFHV
KRSNIWLAAVTKQNVNAAMVFEFLYKMCDDVMAAYFGKISEENIKNNFLLIYELLDEIL
DFGYPQONSETGALKTFITQQGIKSQHOTKEEQSQITSQVTGQIGWRREGIKYRRNELF
LDVLESVNLLMSPQGQVLSAHVSGRVVMKSYLSGMPECKFGMNDKIVIEKQKGKGTAD
TSKSGKQSI AIDDCTFHQCVRLSKFDSERSISFIPPDGEFELMRYRTTKDIIILPFRVI
PLVREVGRTKLEVKVVIKS NFKPSLLAQKIEVRIPTPLNTSGVQVICMKGKAKYKASE
NAIVWKIKRMAGMKESQISAEIELLPTNDKKKKWARPPISMNFEVPPFAPSGLKVRYLKV
FEPKLNYSDDHDVIKWVRYIGRSGIYETRC

FIGURE 36A

Homo sapiens GLUT1 C-terminal binding protein (GLUT1CBP) mRNA

ORIGIN

```

1  cacggggagg cggaggcagc ggcgggcgcg gcggcgggcg cgggcgggcg ggagcagatc
61  ttctggtgac ccactttctc gctgctcatg ccgctgggac tggggcgccg gaaaaaggcg
121  cccctctag  tggaaaatga ggaggctgag ccaggccgtg gagggctggg cgtgggggag
181  ccaggggcctt tgggcggagg tgggtcggg gggcccaaa tgggcttgcc cccctctccc
241  ccagccctgc gggcccgctt tgtgtccac accagctgg cccatggcag tccactggc
301  cgcatcgagg ggttcaccaa cgtcaaggag ctgtatggca agattgccga ggccttccgc
361  ctgccaaactg ccgaggtgat gttttgcacc ctgaacaccc acaaagtga catggacaag
421  ctctggggg gccaatcgg gctggaggac ttcatcttcg ccacgtgaa ggggcagcgc
481  aaggagggtgg aggtgttcaa gtcggaggat gcactcgggc tcaccatcac ggacaacggg
541  gctggctacg ccttcatcaa gcgcatcaag gagggcagcg tgatcgacca catccacctc
601  atcagcgtgg gcgacatgat cgaggccatt aacgggcaga gcctgctggg ctgccggcac
661  tacgaaagtgg ccggctgct caaggaaactg ccccgaggcc gtacctcac gctgaagctc
721  acggagcctc gcaaggcctt cgacatgac agccagcgtt cagcgggtgg ccgccctggc
781  tctggcccac aactgggcac tggccgaggg accctgcggc tcgatcccc gggcccccgc
841  acggtggagg atctgccctc tgcctttgaa gagaaggcca ttgagaaggt ggaatgacctg
901  ctggagagtt acatgggtat cagggacacg gagctggcg ccaccatggt ggagctggga
961  aaggacaaaa ggaacccgga tgagctggcc gaggccctgg acgaacggct ggtgacttt
1021 gccttccctg acgagttcgt cttgacgtc tggggcgcca ttggggacgc caaggtcggc

```

FIGURE 36B

1081 cgctactagg actgcccccg gaccctgcga tgatgacccg ggcgcaacct ggtgggggcc
1141 ccagcaggg aactgacgt caggacccga gcctccaagc ctgagcctag ctgagcagcc
1201 caaggacgat ggtgagggga ggtggggcca ggccccctgc ccgctcaa tcggtaccat
1261 ccctccctg gtcccagtc tggccgggt ccccgcccc cctgtgccct gttccccacc
1321 ctacctcagc tggggtcagg cacagggaag ggagggatc agccaaattt gggcggccac
1381 cccgcctcc accacttcc accatcagct gccaaactgg tccctctgtc tccctggggc
1441 cttgggttct gtttgggggt catgaccttc ctagtctcct gacgcaggga atacaggga
1501 gaggtgtgtc cttccccca gaaatgcaa taatgccctc accctcctg agaggagccc
1561 cttccctgtg gaggctgtta cttccgcat tgcacagagt tgctgtgaac ccgcaacct
1621 cttccccacc tccatctct cttccaggc ccatccctgg ccagagcag gagggaggga
1681 ggacgatgg cgggtgggtt ttgtatctga atttgctgtc ttgaacataa agaattctatc
1741 tgctgttaaa aaaaaaaaaa aaaa

FIGURE 36C

Translation:

MPLGLGRRKKAPPLVENEAEPRGGGLGVGEPLGGGGGQMGGLPPPPPALRPRL
VFHTOLAHGSPTGRIEGFTNVKELYGKIAEAFRLPTAEVMFCTLNTHKVDMDKLLGGQ
IGLEDFIFAHVKGQRKEVEFKSEDALGLTITDNGAGYAFIKRIKEGSVI DHIHLISV
GDMIEAINGQSLLGCRHYEVARLLKELPRGRTFTLKLTEPRKAFDMI SORSAGGRPGS
GPQLGTGRGTLRLRSRGPATVEDLPSAFEEKAIEKVDDLLESYMGIRDTELAATMVEL
GKDKRNPDELAELDERLGDFAFPDEFVFDVWGAIGDAKVGRY

FIGURE 37
ORIGIN

GP130 associated protein GAM

1 ggccgcccgg cgccccagc agnccgagcc ggggcgccaca gncggggngc agaccgcgcc
61 cccgcgcgcg attgacatga tgtttccaca aagcaggcat tcgggctcct cgcacctacc
121 ccagcaactc aaattcacca cctcgactc ctgcgaccgc atcaagagc aatttcagct
181 actgcaagct cagtaccaca gcctcaagct cgaatgtgac aagttagcca gtgagaagtc
241 agagatgcag cgtcactatg tgatgtacta cgagatgtcc tacggcttga acatcgagat
301 gcacaaacag gctgagatcg tcaaaaggct gaacgggatt tgtgccagg tcctgcccta
361 cctctcccaa gaggaccagc agcaggctct gggagccatt gagagggcca agcagggtcac
421 cgctcccagc ctgaactcta tcatccgaca gcagctccaa gccaccagc tgtcccagct
481 gcaggccctg gccctgccc tgaacccact accgtgggg ctgcagccgc cttcgctgcc
541 ggcggtcagc gcaggcaccc gctctcttc gctgtccgcg ctgggttccc agggccacct
601 ctccaaggaa gacaagaacg ggacgatgg tgacaccac caggaggatg atggcgagaa
661 gtcggaattag cagggggccc ggaaggagg gttgggagg gggacagag ggagacagag
721 gcacggagag aaaggaatgt ttagcacaag acacagcga gctcgggatg ggcataaactc
781 ccatagtatt tatggtgccc gccggcgggg gccccagccc agcttgacag ccacctctag
841 ctttcttccc taccctatc ccggcttccc tctcctccc tgcagcctgg ttaggtggat
901 acctgccctg acatgtgagg caagctaagg cctggaggga cagctgggag accagggtccc
961 aaggagcaa gacctgcga agcgacagc accggccct tccccgctt taggcatgtg
1021 taaccgacag tctgcctggg ccacagccct ctcaacctgg tactgcatgc acgcaatgct
1081 agctgcccc ttcctgctc ggnacccc agtctcccc gacccgggt cccagggtatg
1141 ctccacctc cactgccc actcaccac tctgctagtt ccagacacct ccacgcccac
1201 ctggtcctc cctaccgcac acaaaaggg ggaacgagg gacgagctta gctgagctgg
1261 gaggagcagg gtgagggtg gcgaccagg attccccct ccttcccaa ataaacc

Translation:

MFPQSRHSGSSHLPOQLKFTTSDSCDRIKDEFQLLOAQYHSLKLECDKLASEKSEMQR
HYVMYYEMSYGLNIEMHKQAEIVKRLNGICAQVLPYLSQEHQQQVLGAIERAKQVTAP
ELNSIIRQQLQAHQLSLOALALPLTPVGLQPPSLPAVSAGTGLLSLALGSOAHL
SKEDKNGHDGDTHQEDDGEKSD

FIGURE 38

Homo sapiens amino-terminal enhancer of split (AES) mRNA

1	ggccgccccg	cgccccagc	agnccgagcc	ggggcgaca	gncggggcgc	agccccgcgc
61	ccccgccgcg	attgacatga	tgtttccaca	aagcaggcat	tcgggtcct	cgcacctacc
121	ccagcaactc	aaattcacca	cctcggactc	ctgcgaccgc	atcaaaagacg	aatttcagct
181	actgcaagct	cagtaccaca	gcctcaagct	cgaatgtgac	aagttggcca	gtgagaagtc
241	agagatgcag	cgtaactatg	tgatgtacta	cgagatgtcc	tacggcttga	acatcgagat
301	gcacaaacag	gctgagatcg	tcaaaaggct	gaacgggatt	tgtgcccagg	tcctgccccta
361	cctctcccaa	gagcaccagc	agcaggctct	gggagccatt	gagaggcca	agcaggtcac
421	cgctccccgag	ctgaactcta	tcatccgaca	gcagctccaa	gccaccagc	tgtcccagct
481	gcaggccctg	gccctgccct	tgacccact	accgtgggg	ctgcagccgc	cttcgctgcc
541	ggcggtcagc	gcaggcaccg	gcctcctctc	gctgtccgcg	ctgggttccc	agggccacct
601	ctccaaggaa	gacaagaacg	ggcacgatgg	tgacacccac	caggaggatg	atggcgagaa
661	gtcggattag	cagggggccg	ggacagggag	gttgggaggg	gggacagagg	ggagacagag
721	gcacggagag	aaaggaatgt	ttagcacaag	acacagcga	gctcgggatt	ggctaattctc
781	ccatagattt	tatggtggcg	ccggcggggc	ccagcccag	cttgcaggcc	acctctagct
841	ttcttccctac	ccatttcggg	cttccctcct	cctcccctgc	agcctgggta	ggtggatatcc
901	tgccctgaca	tgtgaggcaa	gctaaggcct	ggagggtcag	atggggagacc	aggtcccaaag
961	ggagcaagac	ctgcgaagcg	cagcagcccc	ggcccttccc	ccgttttgaa	catgtgtaac
1021	cgacagtctg	ccctgggcca	cagccctctc	accctggtac	tgcatgacag	caatgcttagc
1081	tgcccttttc	ccgtcctggg	caccccgagt	ctccccgac	ccgggtccc	aggtatgctc
1141	ccacctccac	ctgccccact	caccacctct	gctagtcca	gacacctcca	cgccacctg
1201	gtcctctccc	atcgcccaca	aaaggggggg	cacgaggagc	gagcttagct	gagctgggag
1261	gagcaggggtg	aggggtggcg	accaggatt	ccccctccc	ttcccaata	aagatgaggg
1321	tact					

Translation:

MMFPQSRHSGSSHLPPQLKFTTSDSCDRIKDEFQLLOAQYHSLKLECDKLASEKSEMQ
 RHYVMYYEMSYGLNIEMHKQAEIVKRLNGICAOQLPYLSQEHQQQVLGAIERAKQVTA
 PELNSIIROQLOAHQLSLOALALPLTFLPVGLQPPSLPAVSAGTGLLSLSALGSAH
 LSKEDKNHGHDGTHQEDDGEKSD

FIGURE 39A

Origin Antiquitin 1 (antiquitin=26g turgor protein homolog), mRNA

```

1  cctgctccaa  ggtccagaga  gctttcttgg  ctttgagca  ggctgccc  cttcatgtcc
61  acttcctca  tcaatcagcc  ccagtatgcg  tggctgaaag  agctggggt  ccgcgaggaa
121  aacgaggcg  tgtataatgg  aagctgggga  ggccggggag  aggttatcac  gacctatgct
181  cccgctaaca  acgagccaat  agcaagagtc  cgacaggcca  gtgtggcaga  ctatgaaagaa
241  actgtaaaga  aagcaagaga  agcatggaaa  atctgggcag  atattcctgc  tccaaaaacga
301  ggagaaatag  taagacagat  tggcgatgcc  ttgcggggaga  agatccaagt  actagggaagc
361  ttggtgtctt  tggagatggg  gaaaatctta  gtggaagggt  tgggtgaagt  tcaggagtat
421  gtggatatct  gtgactatgc  tgttggttta  tcaaggatga  ttggaggacc  tatcttgccct
481  tctgaaagat  ctggccatgc  actgattgag  cagtggaaatc  ccgtaggccct  ggttggaatc
541  atcacggcat  tcaatttccc  tgtggcagtg  tatggttgga  acaacgccat  cgccatgcatc
601  tgtggaatg  tctgcccttg  gaaaggagct  ccaaccactt  ccctcattag  tgtggctgtc
661  acaaagataa  tagccaaggt  tctggaggac  aacaagctgc  ctggtgcaat  ttgttccctg
721  acttgtgtg  gacgagatat  tggcacagca  atggccaaag  atgaacgagt  gaaacctgctg
781  tccttcactg  ggagcactca  ggtgggaaaa  caggtgggct  tgatggctgca  ggagagggttt
841  ggagaaagtc  tgttggaact  tggaggaaac  aatgccatta  ttgcccttga  agatgcagac
901  ctacgttag  ttgttccatc  agctctcttc  gctgctgtgg  gaaacagctg  ccagagggtgt
961  accactgcga  ggcgactgtt  tatacatgaa  agcatccatg  atgaggttgt  aaacagactt

```

FIGURE 39B

```

1021   aaaaaggcct atgcacagat ccgagtggg aaccatggg acctaatgt tctctatggg
1081   ccactccaca ccaagcaggc agtgagcatg ttctctggag cagtggaaaga agcaaaagaaa
1141   gaaggaggca cagtgggtcta tgggggcaag gttatggatc gccctggaaa ttaatgtagaa
1201   ccgacaattg tgacagggtct tggccacgat gcgtccattg cacacacaga gaccttcgct
1261   ccgatttctt atgtctttaa attcaagaat gaagaagagg tcttgcattg gaaataaaga
1321   gtaaaacagg gactttcaag tagcatcttt accaaagatc tgggcagaat ctttcgctgg
1381   cttggacctc aaggatcaga ctgtggcatc gtaaatgtca acatccaac aagtggggct
1441   gagattggag gtgcccttgg aggagaaaaa cacactgggtg gtggcaggga gtcctggcagt
1501   gatgcctgga aacagtacat gagaaggctt actgtacta tcaactacag taaagacctt
1561   cctctggccc aaggaaatcaa gtctcagtaa agtggtttaa gatgaaacatc ccttaatttg
1621   aggtgttcca gcagctgttt ttggagaaga caaagaagat taaagtttc cctgaaataaa
1681   tgcattatta tgactgtgac agtgactaat cccctatga cccaaagcc ctgattaaat
1741   caagagattc cttttttaa aatcaaaaata aaattgttac aacatagcca tagttactaa
1801   aaaaaaaaaa

```

FIGURE 39C

Translation:

MSTLLINQPQYAWLKELGLREENEGVYNGSWGGRGEVITTYCPANNEPIARVRQASVA
 DYEE TVKKAREAWKIWADI PAPKRGEI VRQIGDALREKIQVLGSLVSLVMGKILVEGV
 GEVQEYVDICDYAVGLSRMIGGPILPSERSGHALIEQWNPVGLVGIITAFNFPVAVYG
 WNNAIAMICGNVCLWKGAPTTSLISVAVTKIIAKVLEDNKLPGAICS LTCCGADIGTA
 MAKDERVNLLSFTGSTQVGKQVGLMVQERFGRSLLLELGGNNAI IAFEDADLSLVVPSA
 LFAAVGTAGQRCCTARRLFIHESI HDEVVNRLKKAYAQIRVGNPWPDPNVLYGPLHTKQ
 AVSMFLGAVEEAKKEGGTVVYGGKVMDRPCGNVVEPTI VTGLGHDASIAHTETFAPILY
 VFKEFKNEEEVFAWNNEVKQGLSSSI FTKDLGRIFRWLGPKGSDCGI VNVNI PTSGAEI
 GGAFGGEKHTGGRESGSDAWKQYMRRTCTINYSKDLPLAQGIKFQ

FIGURE 40

ARP2/3 protein COMPLEX 41 KD SUBUNIT (P41-ARC), mRNA

Origin	1	ggcacgagg	agcccgagc	cggttcggc	cgtcgactgc	ccagagtcgc	cggccggggc
	61	gcgggaggag	ccaagccgc	atggctacc	acagcttcc	ggtggagccc	atcagctggc
	121	acgcttgaa	caaggaccgc	accagattg	ccatctgccc	caacaaccat	gaggtgcata
	181	tctatgaaa	gagcgtgccc	aaatggacca	aggcgacga	gctcaaggag	caacaacgggc
	241	aggtgacagg	catcgactgg	gcccccgaga	gtaaccgtat	tgtgacctgc	ggcacagacc
	301	gcaacgccta	cgtgtggacg	ctgaagggcc	gcacatggaa	gccacgctg	gtcatcctgc
	361	ggatcaaccg	ggctgcccgc	tgcgtgcgct	ggccccccaa	cgagaacaa	tctgctgtgg
	421	gcagcggctc	tcgctgtgac	tccatctgtt	atttcgagca	gaggaatgac	tggcgggttt
	481	gcaagcacat	caagaagccc	atccgctcca	ccgtcctcag	cctggactgg	cacccccaaca
	541	atgtgctgct	ggctgccggc	tcctgtgact	tcaagtgtcg	gactctttcca	gcccacacaca
	601	aggaggtgga	ggaacggccg	gcaccaccc	cgtggggctc	caagatgccc	tctgggggaa
	661	tgatgttcga	atccagcagt	agctgcggct	gggtacatgg	cgtctgttcc	tcaagccagcg
	721	ggagccgcgt	ggcctgggta	agccacgaca	gcaccgtctg	cctggctgac	gcccgaacaagg
	781	agatggccgt	cgcgactctg	gcctctgaaa	cactaccact	gctggcgctg	acccctcactca
	841	cagacaacag	cctggtgcca	gcgggccacg	actgcttccc	ggtgctgttcc	acccctcactca
	901	ccgccgcggg	gatgctgagc	tccggcgggc	ggctggacgt	tccctaaagcag	agctctcgcagc
	961	gtggcttgac	ggcccgcgag	cgtctccaga	acctggacaa	gaaaggcgaagc	tccgaggggtg
	1021	gcacggctgc	ggcgcgggc	ctagactcgc	tgacacaaga	cagcgtcagc	caagactctcgg
	1081	tgctcagcgg	cggcaaggcc	aagtgtcgc	agttctgcac	cactggcagca	gactggcgggca
	1141	tgagtatctg	ggatgtgaa	agcttgga	cagccctgaa	ggaccctcag	actcaaatgac
	1201	ctgtgaggaa	tatgttgcc	tcatccta	tgctgggga	gcgggggagag	gggtcagggga
	1261	ggctaagtgt	tgctttgctg	aatgtttctg	gggtaccaat	acgagttccc	actagggggctg
	1321	ctccctcaaa	aagggagggg	acagatgggg	agcttttctt	acctatctca	gttaatatcgtg
	1381	cccttttctt	aaatgcttcc	atttattgaa	aaaaaaaaaa	aaaaaaaaaa	

Translation:

MAYHSFLVEPI SCHAWNKDRTOIAICPNNHVEHIEKSGAKTKVHELKEHNGQVTGI
 DWAPESNRIVTCGTDNRNAYVWTLKGRTWKPTLVILRINRAARCVRWAPNENKFAVGS
 SRVISICYFEQENDWVCKHIKKPIRSTVLSLDWHPNNVLLAAGSCDFKCRIFSAYIK
 EVERPAPTPWGSKMPPFGELMFESSSSCGVHGVCFASGSRVAWVSHDSTVCLADAD
 KKAVATLASETLPLLALTFTDNSLVAAGHDCFPVLFYDAAAGMLSFGGRLDVPKQ
 SSQRLTARERFQNLDKKASSEGTAAGAGLDSLHKNSVSQISVLSGGKAKCSQECTT
 GMDGMSIWDVKSLESALKQLKIK

FIGURE 41A

H. sapiens seb4D mRNA

Origin	1	gagcgcgggt	tcttcgcggc	ccctggccgc	ccccgcgctc	atgtacggct	cgcagaagg
	61	caccacgttc	accaagatct	tcgtgggcgg	cctgcccgtac	cacactaccg	acgcctcgc
	121	caggaggtac	ttcgagggtc	tcggcgacat	cgaggaggcc	gtggtcata	ccgaccgcga
	181	gacgggcaag	tcggcggtc	acggcttcgt	gacctggcc	gaccggcg	cagctgagag
	241	ggcttgcaaa	gacctaac	ccatcatcga	cgcccgcaag	gccacgtga	acctggcata
	301	tcgggcgc	aagccttgg	gtctccagac	gggctttg	atggcgctgc	agcagctgca
	361	cccaccttg	atccagcga	cttacgggtc	gacccgcac	tacatctacc	caccagccat
	421	cgtagagcc	agcgtggtga	tcacagcgc	ccctgtccc	tcgctgtcct	cggcctacat
	481	tgagtacacg	ccggccagcc	cggtctacgc	ccagtaccca	ccggccacct	atgaccagta
	541	ccatacgcc	gcctgcctg	ccacggctga	cagcttcgtg	ggctacagct	acctgcccgc
	601	cgtagcagc	gccctctcag	ccgtagcacc	cgccggcacc	acttcctg	agtaaccaggc
	661	gccgcagctg	cagcctgaca	ggatgcatg	agggcgctc	ctgccccgag	gactgtggca
	721	ttgtcacctt	cacagcagac	agagctgcca	ggccatgatg	ggctggcgac	agcccggtcg
	781	agcttcagtg	aggtgccacc	agcaccctg	ctccgaaga	ccgctcgggc	attccgcctg
	841	gccccggga	cagcggagag	acggctcttc	tttaattctag	gtcccatctg	gtcttgagg
	901	aggactttt	agaaatgactg	agaaactatt	aaagacgcaa	tcacaggttc	cttgcaacac
	961	atggcagcct	ctccttgca	cttctcctg	ctctccacac	tcacaggttc	ctcagggctg
	1021	tgccccccact	gtgcatcgt	ggcggggtgt	cacagaccct	ctgcagcccc	tggtgcccc
	1081	ggactgtgca	gagatgcctg	actccaggga	aacctgaaa	caagaagtta	atggactgtt
	1141	tattgtaact	tgatccctcc	gagctgtgag	cgcatctga	ggcttgagg	cacggccctc
	1201	tggtggagtc	ccatttttc	catcagggca	cgtagggcg	ttcttcaagc	ccggaggagc
	1261	tcccaggcgc	acaggggcgc	ccggtaacag	ggccgcgcgc	ccaaaggccc	cttccagctc
	1321	atagcactga	agttgcaact	ttttctctg	aatgttttg	ctactaagat	aatcttcagaa
	1381	gttcagicta	ttttttcagc	ggatactgcc	gccaccaaga	atccaaacct	aggaa

Translation:

SAGFSRPLAAPGVMYGSKGTTFTKI FVGGLPYHTTDASLRKYFFEGFDIEEAVVITD
 RQTGKSRGYGFVTMADRAAAERACKDPNPIIDGRKANVNLA YLGAKPWCLQTGFAGV
 QQLHPTLIQRTYGLTPHYIYPPAIVQPSWVIPAAPVPSLSPPYIEYTPASPVYAQYPP
 ATYDQYPYAASPATADS FVGXSYFAAVHQAASAAAPAGTTFVQYQAPQLQPDPMQ

FIGURE 41B

H. sapiens seb4B mRNA

Origin	1	gcggcgatg	cagtacaacc	ggcgctttgt	caacgtgtg	ccacacctg	gcaagaagaa
61	gggcaccacg	ttcaccaaga	tcttcgtggg	cgccctgccg	taccacacta	ccgacgcctc	
121	gctcaggaag	tacttcgagg	gcttcggcga	catcgaggag	gccgtggtca	tcaccgaccg	
181	ccagacgggc	aagtcgccg	gctacggctt	cgtgaccatg	gccgaccggg	cggcagctga	
241	gagggttgc	aaagacccta	accccatcat	cgacggccgc	aaggccaacg	tgaacctggc	
301	atatctgggc	gccaaagcctt	ggtgtctcca	gacgggcttt	gccattggcg	tgcagcagct	
361	gcacccacc	ttgatccagc	ggacttacgg	gctgaccccg	cactacatct	acccaccagc	
421	catcgtgcag	cccagcgtgg	tgatcccagc	cgccctgtc	ccgtcgctgt	cctcgcccta	
481	cattgagtag	acgccggcca	gcccggtcta	cgccagtagc	ccaccggcca	cctatgacca	
541	gtaccatac	gccgcctcgc	ctgccacggc	tgacagcttc	gtgggctaca	gctacccctgc	
601	cgccgtgcac	caggccctct	cagccgcagc	acccgcgggc	accactttcg	tgcagtacca	
661	ggcgcgcag	ctgcagcctg	acaggatgca	gtgaggggcg	ttcctggccc	gaggactgtg	
721	gcattgtcac	cttcacagca	gacagagctg	ccaggccatg	atgggctggc	gacagcccg	
781	ctgagcttca	gtgaggtgcc	accagcacc	gtgcctccga	agaccgctcg	ggcatctccg	
841	ctgcgccctg	ggacagcggg	gagacggctt	ctctttaatc	taggtcccat	tgtgtctctga	
901	gggaggactt	ttaagaatga	ctgagaacta	tttaaagacg	caatcccagg	ttccttgcac	
961	accatggcag	cctctccttg	cacctctctc	tgctctcca	cactccagg	ttcctcaggc	
1021	ttgtgtccc	actgtctcat	cgtggcgggg	tgtcacagac	cctctgcagc	ccctggctgc	
1081	cctggactgt	gcagagatgc	ctgactccag	ggaacctga	aagcaagaag	ttaatggact	
1141	gtttattgta	acttgatcct	cccgagctgt	gagcgagtc	tgaggtctga	ggacacggcc	
1201	tcctgttggg	gtcccatttt	ctccatcagg	gcacgtgggc	ggcttctcca	agcccgagg	
1261	agctcccagg	cgacacgggg	ccgccggtta	caggggcccgc	cggccaaaag	cccccttcca	
1321	gtcatagcac	tgaagttgca	acttttttct	tgtaatgtt	ttgctactaa	gatataattca	
1381	gaagttcagt	ctattttttc	agcgatact	gccgccacca	agaatccaaa	cctaggga	

Translation:

RRMQYNRRFVNVPFTGKKKGTTFTKIFVUGGLPYHTTDASLRKYFEGFGDIEAVVIT
 DRQTGKSRGYGFVTWADRAAAERACKDENPIIDGRKANVNLAYLGAKPCHLOTGFAIG
 VQQLHPTLIQRTYGLTPHYIYPPAIVQPSVVI PAAPVPSLSSPYIEYTPASPVYAQYF
 PATYDQYPYAASPATADS FVGYSYPAAVHQALSAAAPAGTTFVQYQAPQLQPDRLMQ

FIGURE 42A

Homo sapiens lamin A/C (LMNA) mRNA

<p>Origin</p> <p>1</p> <p>61</p> <p>121</p> <p>181</p> <p>241</p> <p>301</p> <p>361</p> <p>421</p> <p>481</p> <p>541</p> <p>601</p> <p>661</p> <p>721</p> <p>781</p> <p>841</p> <p>901</p> <p>961</p>	<p>actcagtggt cgcgggagcc gcacctacac cagccaaccc agatcccag gtcgcgacagc</p> <p>gccccggccca gatccccacg cctgccagga gcaagccgag agccagccgg ccggcgacct</p> <p>ccgactccga gcagtctctg tccttcgacc cgagccccgc gcccttctccg ggacccccctgc</p> <p>cccgcgggca gcgctgccaa cctgccggcc atggagaccc cgtcccagcg gcgcgcaccc</p> <p>cgcagcgggg cgcaggccag ctccactccg ctgtcgccca ccgcactcac ccggcctgcag</p> <p>gagaaggagg acctgcagga gctcaatgat cgcttggcgg tctacatcga ccgtctgcgc</p> <p>tcgctggaaa tcgctggcgc agggctgcgc cttcgcata caagctctga agaggctggctc</p> <p>agccgcgagg tgtccggcat caaggccgcc taagaggccg agctcggggga tgcctcgcaag</p> <p>acctttgact cagttagcaa ggagcgcgcc cgctcgcagc tggagcttgag aggtctgacct</p> <p>gaggagttta aggagctgaa agcgcgcaat accaagaaag agggctgaccc aggtctgacct</p> <p>caggctcggc tgaaggacct gagggtctctg ctgaaactca aggagggccgc acctgagcaact</p> <p>gctcttcagt agaagcgcac gctggagggc gactgcatg aagcaacttc aggactgagat</p> <p>aagcttgagg cagccctagg tgaaggccaag aaggaggaac tggacttcca ggaaggacact</p> <p>gtggatgctg agaacaggct gcagaccactg accaagcgc cgtcactgag caagacttgc</p> <p>tacagtgagg agctgcgtga gaccaagcgc cgtcactgag caagacttgc cgtcacttgc</p> <p>aatgggaaag agctgtgagt tcgagagccgg ctggcggaag cgtctgcagc aggtctgc</p> <p>cagcatgagg accaaggctga gcaqtactaa aaggagctgg accaaggacatc tctctgcacag</p>
---	---

FIGURE 42B

1021 ctggacaatg ccaggcagt c tgc t g a g a g g a a c a g c a a a c c t g g t g g g g g c t g c c c a c g a g
 1081 g a g c t g c a g c a g t c g c g c a t c g a c c g c a t c g a c a g c c t c t c g c c a g c t c a g c c a g c t c c a g
 1141 a a g c a g c t g g c a g c c a a g g a g g c c a a g g t g c t g g a a a g g a g a c c t g g a g g a c t c a c t g g c c c g t g a g
 1201 c g g g a c a c c a g c g g c g g c t g c t g g c g g a a a g g a g c g g g a g a t g g c c g a g a t g c g g g c a
 1261 a g g a t g c a g c a g c a g c t g g a c g a g t a c c a g g a g c t c t c t g g a c a t c a a g c t g g c c c t g g a c
 1321 a t g g a g a t c c a c g c c t a c c g c a a g c t c t t g g a g g c g a g g a g g a g a g a g a g g c t a c g c c t g t c c
 1381 c c a g c c c t a c c t c g c a g c g c a g c c g t g g c c a g t g c t c c t c t c a c t c a t c c a g a c a d a g
 1441 g g t g g g g g c a g c g t c a c c a a a a a g c g c a a a c t g g a g t c c a c t g a g a g c c g c a g c a g c t c
 1501 t a c a g a c a g c a c g c a c t a g c g g c g c g t g g c c g t g g a g g g c c g t g g a t g a t g a g g a g g g g c a a g
 1561 t t t g t c c g g c t g c g c a a c a a g t c c a a t g a g g a c a g t c c a t a c c g g t t g t g g c a a t t g g a g a t c a a g
 1621 c g c c a g a a t g g a g a t g a t c c c t t g c t g a c t t a c c g g t t c c c a c c a a a g t t c a c c c t g a a g
 1681 g c t g g g c a g g t g g t g a c g a t c t g g g c t g c a g g a g c t g g g g a a g c c a c c c a c a g c c c c c t a c c
 1741 g a c c t g g t g t g a a g g c a c a g a a c a c c t g g g a c t g c g g g a a c a g c c t g c g t a c g g c t c t c
 1801 a t c a a c t c c a c t g g g g a a g a g t g g c c a t g c g c a a g c t g g t g c g c t c a a g t g c a c t g t g g t t
 1861 g a g g a c g a c g a g g a t g a g g a t g a g g a t g g a g a t g a c c t g c t c c a t c a c c a c c a t g t g a g t g g t a g c
 1921 c g c c g c t g a g g c c a g c c t g c a c t g g g g c c a c c a g c c a g g c c t g g g g g c a g c c t c t c c c
 1981 c a g c c t c c c g t g c c a a a a t c t t t t c a t t a a g a a t g t t t g g a a c t t t

FIGURE 42C

Translation:

METPSQRRATRSQAQASTPLSPTRITRLQEKEDLQELNDRRLAVYIDRVRSLETENAG
LRLRITESEEVSVREVSIGIKAAEAEELGDAKTLDSVAKERARLQLELSKVREEEFKEL
KARNTKKEGDLIAAQARLKDLEALLNSKEAALSTALSEKRTLGEGLHDLRGQVAKLEA
ALGEAKKQLQDEMLRRVDAENRLOQTMKEELDFQKNIYSEELRETCKRRHETRLVEIDNG
KQREFESRLADALQELRAQHEDQVEQYKKKELEKTYSAKLDNARQSAERNNSNLVGAAHE
ELQQSRIRIDSLSAQLSLOKQLAAKEAKLRDLEDLSLAREDTSRRLLAEKEREMAEM
RARMQQQLDEYQELLDIKLALDMEIHAYRKLLEGEERLRLSPSPTSQSRGRASSHS
SQTQGGGSVTKKRKLESTESRSSFSQHARTSGRVAVEEVDEEGKFVRLRNKSNEDQSM
GNWQIKRQNGDDPLLTYRFPKFTLKAGQVVTIWAAGAGATHSPPTDLVWKAQNTWGC
GNSLRTALINSTGEEVAMRKLVRSVTVVEDEDEDDLLHHHHVSGSRR